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BRAITHWAITE'S RETROSPECT.

VOL. XXXVI. JULY—DECEMBER, 1857.

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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE,

LECTURER ON OBSTETRIC MEDICINE AT THE LEEDS SCHOOL OF MEDICINE, ETC.

VOL. XXXVI. JULY—DECEMBER,
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A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

DISEASES AFFECTING THE SYSTEM GENERALLY.

AGUE.—The injection of disulphate of quinine diminishes the quantity of uric acid in the urine. In ague there is a considerable increase of uric acid in the urine. It is possible that further observation on this point may throw much light on the nature of this disease. (Dr. Ranke, p. 383.)

CACHEXIA.—In the treatment of that class of cases so frequently seen in children, characterized by large heads, tumid bellies, and pasty complexions, nothing is so efficacious as a simple combination consisting of from five to ten grains of phosphate of lime three times a day, in chalk mixture. Where there is palpable anæmia, some simple chalybeate must be added. (Dr. W. Budd, p. 34.)

CANCER.—The hygienic measures necessary in the treatment of the non-ulcerated tumour are, plenty of good wholesome food, a well-drained, well-ventilated house, pure country air, extreme cleanliness of person and clothing, with sufficient exercise and mental occupation and amusement: these will do much towards establishing a more healthy state of the system. Deficient action of the skin, kidneys, and digestive organs must be corrected, and if pain exists it must be relieved by opium or hemlock. A combination of iron and iodine, and the iodide of arsenic have both been exhibited with excellent effect in this disease. but the bromide of potassium given in doses of five or ten grains with cod-liver oil is the most useful, the effects on the tumour being "really remarkable." The local applications which are of value are preparations of lead, iodine, and bromia. A formula much used in the Cancer Hospital is equal parts of liquor plumbi, almond oil, diluted acetic acid, and water. This preparation allays pain, and apparently hastens the absorption of the indurated tissues around the tumour. The use of solutions of iodide of lead or iodide of potassium in glycerine is very beneficial, and the solution of bromide of potassium in glycerine appears to be even more so. Dr. Arnott's freezing process has reduced many large adherent tumours to a small, movable, indolent condition. Mechanical pressure is often very useful in the non-ulcerated tumour. This

is best applied by an air-truss as invented by Dr. Neil Arnott, for by this means the support is perfectly uniform over the whole surface of the tumour. The amount of pressure must be regulated by a spring pressing on the back of the truss. When the tumour is ulcerated, Dr. Marsden recommends carrot poultices, to arrest the fetor; but their application is rather painful. Should bleeding take place from the ulcerated surface it is best arrested by a solution of perchloride of iron. Except in cases of very free bleeding it should only be of sp. gr. 15°, as above this it acts as a caustic. To the unhealthy fetid surface left after the separation of a cancerous tumour a lotion of chlorate of potash is the best application. To relieve pain, opium given internally is the most effectual means; or an ointment of lead and a little morphia may be used, if the former means is not thought advisable. The sulphate of zinc is the most safe and effectual mode of destroying malignant growths about the female genital organs. (Mr. T. Spencer Wells, p. 25.)

To obtain a healthy granulating surface to ulcerated cancerous tumours, having attachments to bone or to vital parts, (and for this purpose alone is the use of caustics in this disease advisable), manganic acid in combination with potassa as a base is a most invaluable agent. The "manganese cum potassa" caustic is a dark green powder, and may be applied very readily by means of a small pepper-castor. When used to reduce an exuberant growth, it must be applied in a layer as thick as the tissue to be destroyed, and then formed into a paste by dropping a little water upon it, after which some simple dressing may be applied. By means of carrot poultices the eschar drops off in three or four days. It is less powerful than other caustics, and it at once removes all fetor from the ulcer. Crops of warts may also be conveniently removed by its agency. (Mr. W. Cooke, p. 29.)

Dr. Fell's Treatment.—If non-ulcerated, the skin must first be removed by some liquid caustic, as nitric acid. The tumour so exposed must be covered by a layer of chloride of zinc paste spread on linen. The following formula is used:—℞. Sanguinariæ canadensis, ℥ss. vel ℥i.; chlor. zinci, ℥ss. vel ℥ij.; aquæ, ℥ii.; pulv. sem. tritic. hibern., q. s. Mix, and form a paste the consistence of treacle. Through the slough so produced incisions are to be made with the knife, and strips of cotton spread with the paste introduced daily, till the whole tumour is seriatim converted into one large eschar, which drops out entire in about 12 or 14 days. To any secondary tumour or enlarged lymphatic gland, the following ointment may be applied:—℞. Sulph. zinci, ℥vi.; sanguinariæ, ℥ij.; myricæ ceriferæ, ℥j.; extr. opii (aquos), extr. conii, aa ℥vi; ungt. cetacei, ℥vi. Mist. et fiat ungt. With this ointment one containing iodide of lead may be applied alternately every twelve hours. (Dr. Fell, p. 31.)

Gastric Fever of Children.—The following treatment is adopted by Dr. Farre of King's College Hospital. To a child of a year and a half to four years old give a mixture containing a drachm each of the diluted nitric and hydrochloric acids to six ounces of water, in doses of half an ounce three times daily, with about four grains of grey powder every night at bed-time. If the disease is passing off, omit the powder, and give the acids in infusion of quassia or with bark. (Dr. A. Farre, p. 16.)

Glossal Cancer.—In those distressing cases of glossal cancer, where deep and unhealthy ulcers exist, the best treatment is to apply powdered sulphate of copper by means of a camel-hair brush, about twice a day. Allow it to remain four or five minutes, then let the mouth be washed out with tepid water. A wash of borax may also be used frequently during the day. Under this treatment the ulcers sometimes slowly heal up and cicatrize. (p. 34.)

Rheumatism, *Acute.*—The abstraction of twelve or fifteen ounces of blood is generally indicated in the commencement of this disease—though this should not be repeated on account of the remarkably firm buffy coat which invariably forms. Half an ounce of castor oil should be given, and repeated every other morning. Immediately after the purgative has ceased to operate, the following medicine is to be commenced:—℞. Hydrargyri chloridi, aloes extracti aquosi, aa gr. vj.; pulveris opii, extracti colchici acetosi, antimonii potassio-tartrat. aa gr. iij.; confectionis rosæ q. s. M. Divide massam in pilulas duodecim, quarum sumatur una 4ta quaque hora, cum haustu infra prescripto. ℞. Potassæ bicarbonatis ℈j; acidi citrici gr. xv.; liquoris potassæ ℥x.; potassæ nitratis gr. x.; syrupi ℥j.; aquæ puræ ℥iss. M. Fiat haustus. The symptoms will soon be much relieved, and in twelve or fourteen days the febrile symptoms will be subdued. During recovery an alkaline tonic may be given. (Dr. W. S. Oke, p. 16.)

The treatment of acute rheumatism by one or other of the salts of potash has now become the established practice of the leading London physicians. Dr. Barlow has lately been trying the bicarbonate, but does not find it so effectual as the acetate which he had previously been in the habit of using. A combination of the nitrate, bitartrate, and acetate, given well diluted, is a good form of administration. (p. 20.)

If the portal system is congested, as shown by arrest of the biliary and urinary secretions, exhibit a brisk mercurial alterative and purgative, repeating this if necessary during the attack. Then prescribe lemon-juice in the proportion of a tea-spoonful or dessert-spoonful, according to the age and size of the patient, every second hour. This of itself tends also to keep the bowels free. A little morphia, the dose being carefully regulated, may be given at bed-time. Dr. Sandwith, of the Hull Infirmary, has recently treated ten cases with

acetate of potash, with unusual success. It should be well diluted, and may be combined with lemon-juice. (Dr. W. Moore, p. 20.)

Chronic Rheumatism and Gout.—Apply thin sheets of gutta percha over the parts; this produces great local transpiration, and the pain is generally considerably relieved. (Dr. Wetzler, p. 22.)

Scarlatinal Dropsy.—That purgative which acts most directly as a hydragogue is the best adapted for use in the treatment of this disease; but it must be one which at the same time is not followed by any disproportionate exhaustion, or by any torpid reaction. The combination of jalap and cream of tartar is most admirably suited to these ends. The development of that pigmentary condition, made apparent by adding nitric acid to the boiling urine, in combination with albumen, is of the greatest import. The presence of much fatty matter in the casts of the tubes seen with the microscope, also indicates an advanced state of degeneration. (Dr. Basham, p. 13.)

Typhus Fever.—Secure free ventilation, cleanliness, and particular attention to the digestive organs; commencing with an emetic dose of ipecacuanha, aperients, and saline medicines. In the low states, give sulphate of quinine three times during the day, and mild nourishment at frequent intervals during both day and night. Alcoholic stimulants are not required at any period of the disease, and are sometimes even injurious. (Mr. J. Higginbottom, p. 395.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—In cases of chorea, if complicated with struma, administer the iodide of zinc; if no indications of this disease exist, the sulphate may be used. (Dr. Barlow, p. 41.)

Neuralgia.—The following plan of treatment is productive of most satisfactory results. A small glass syringe, with a perforated steel nozzle, is made to penetrate the tissues, to the depth of an inch or so, at the most painful spot, and about twenty minims of Battley's sedative solution is injected. This must be repeated, if necessary, good food, and tonics being meanwhile given; the relief from pain is often followed by a rapid improvement in the general health, the appetite returns, and the disturbed nervous system is restored to a state of health. (Dr. A. Wood, Dr. G. L. Bonnar, p. 43.)

Valerianate of ammonia will be found an excellent remedy in cases of neuralgia. It has been tried by various eminent physicians with much success. (Dr. O'Connor, p. 408).

Tetanus.—On the first appearance of this disease, try if you can remove the source of irritation, by dividing the nerves going to the part; or, if the wound be in the skin and very trifling, either make

deep incisions around it or excise it altogether; but if the wound be such as would materially injure the limb independently of the tetanic complication, it is better to amputate at once. If this does not suffice, we must use some agent to render the nervous system less sensitive to the irritating cause, its effect being long kept up—such agents we have in chloroform, nicotine, and wourali. Chloroform causes congestion of the bronchial tubes, and nicotine has an extreme depressing influence on the circulation. Now wourali does not act on the heart or other involuntary muscles at all, and preference should be given to it. Artificial respiration will be necessary, if that function become seriously embarrassed. (Dr. S. H. Hobart, p. 36.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

Nævi.—Pass two pins at right angles to each other under the mass, and place a ligature around the whole, tying it tightly and withdrawing the pins. At the end of four hours withdraw the ligature. A scab forms, which drops off in fourteen days or so, without any suppuration or open sore, and leaving but a very slight scar. By this means the current of blood is arrested, and that in the tumour becomes consolidated. One great advantage is that the part encircled does not slough, but becomes atrophied and drops off. (Mr. J. C. Forster, p. 227).

Remove the epidermis by a blister, and then touch the denuded dermis with a pencil of charpie wetted with perchloride of iron, at 30° of the hydrometer of Baume (Sp. gr. 1·245). (M. Paul Broca, p. 228.)

Rheumatic Pericarditis.—Dr. Todd treats this and other forms of rheumatic inflammation on a stimulant plan throughout, not with a view of cutting short the disease, but of supporting the patient under it, and rendering convalescence more rapid. In a case lately under treatment, alkalies were given alone, till the appearance of the pericarditis, when opium in grain doses, every four hours, and eight ounces of brandy daily, were administered. Pneumonia of both lungs came on, and the brandy was ultimately increased to thirty-five ounces daily. No leeches or blisters were throughout employed. He left the hospital to all appearance quite well at the end of a month. (Dr. R. B. Todd, p. 50.)

AFFECTIONS OF THE RESPIRATORY ORGANS.

Chronic Bronchitis.—In cases of bronchitis of long standing, the following mixture is very useful:—Take of tannin three grains; extract of belladonna three quarters of a grain; extract of conium two and a half grains; infusion of senna three ounces; fennel-water and syrup of marsh-mallows of each one ounce and a half: M. A tablespoonful to be taken every two hours. (M. Berthel, p. 58.)

Foreign Bodies in the Air Passages.—*Tracheotomy.*—An ingenious and advantageous plan of operating in these cases, is to lift up a piece of the trachea like a flap, with a common tenaculum, after the tube has been laid bare, and then, having allowed the foreign body to be expelled, to drop the flap down again into its original position. (Mr. J. C. Forster, p. 229.)

Tuberculosis.—The proximate cause of the tubercular diathesis is the decrease in the system of the phosphorus which it contains in an oxygenizable state. Therefore give some preparation of phosphorus in the lowest possible degree of oxydation, and at the same time, one which may be directly assimilated; such a remedy is the hypophosphite of soda, or lime, which should be given in doses of from ten grains to a drachm to adults in the twenty four hours. The general symptoms will rapidly disappear. (Dr. J. F. Churchill, p. 58.)

AFFECTIONS OF THE DIGESTIVE ORGANS.

Cholera.—This depends on the withdrawal of the nervous power of the brain and spine from the nerves of the body presiding over respiration and digestion, particularly the pneumogastric. In the treatment then we must have recourse to some remedy possessing an instantaneous effect over the brain and nerves. Such a remedy we have in an emetic acting directly on the brain, the use of which is generally followed by an amendment of the pulse, and other favourable symptoms. This must be followed by an opiate. When the pulse is small and thready, respiration almost suspended, and lividity pervading the whole system, owing to the contracted state of the lungs, chloroform is the grand remedy. When first inhaled the pulse becomes full and bounding; after a time it again begins to sink, then withdraw the chloroform for a time, repeating the process till the patient lapses off to sleep. When there is incessant vomiting give thirty or forty minims of tincture of opium, and then administer the chloroform which instantly checks the vomiting, the opiate becomes absorbed, and sleep soon follows. (Mr. A. C. Boate, p. 112.)

Asiatic Cholera.—A case lately occurred to Dr. Henry Madge, of Howland-street, Fitzroy-square, which was treated successfully on the following plan. Hot water was applied to the feet, warm flannels to the legs and arms, a large mustard poultice was placed over the whole abdominal region, stimulants were given, and two tablespoonfuls of the following mixture every hour:—Acetate of lead, fifteen grains; acetic acid, half a drachm; tincture of opium, half a drachm; tincture of capsicum, eight minims; and peppermint-water to six ounces. Dr. Madge believes calomel to be injurioue in these cases. (p. 117.)

Diarrhœa.—The best diet as a general rule is milk and lime-water, which is very readily absorbed, and sufficiently nourishing. When there are lumps of fæculent matter in the stools, and a smell like that of normal excrement, give purgatives. When this is not the case purgatives will not be found to be beneficial. When the products of acute inflammation are found mixed in the stools, such as white and opaque mucus, flakes of fibrine, epithelium, &c., leeches, fomentations, warm hip-baths, and poultices to the abdomen are the appropriate treatment, together with the administration of calomel, ipecacuanha, and carbonate of soda. In children it often arises from the irritation of teething. The gums must be lanced. Opium in the form of Dover's powder (half a grain every three hours) is here of striking utility. When blood is passed from the bowels, and no fever is present, the most powerful means of checking it are turpentine and acetate of lead. When the diarrhœa is from ulceration of the ilia, adhere to the milk and lime-water diet, giving chalk and opium; or, if these fail, sulphate of copper. When there is a simple flux of transparent mucus, without fever or pain, or any fibrine or blood in the motions, use vegetable astringents, such as logwood, bark, kino, and tannin. When the stools are bulky and copious, opium must not be given, but it is of great use in cases of tenesmus. (Dr. T. K. Chambers, p. 83*)

Dover's powder in five-grain doses, given in a teaspoonful of gruel, and repeated every loose stool, is one of the simplest and most effectual means of treating cases of ordinary diarrhœa. (Mr. W. O. Markham, p. 112.)

Digestion *in Disease*.—In most chronic diseases, especially blood diseases, as anæmia, if we can remove the functional impediment to the proper assimilation of food, arising from indigestion, we go a great way towards ameliorating or curing the complaint, and we further the proper action of other remedies employed. Thus, if in anæmia, during the administration of iron, we can improve the condition of the alimentary canal, the stools from consisting chiefly of semi-digested matter becoming natural, the patient rapidly recovers strength and vigour. Again, if elaterium be given when the portal system is congested, it must be given in much larger doses, three grains being borne sometimes, than when the condition is removed by a few leeches to the anus, after which half a grain will produce excessive purgation. (Dr. T. K. Chambers, p. 68.)

Dyspepsia.—In excessive acidity and flatulence of the stomach, regulate the quantity and quality of the food, keep the bowels open by some warm aperient, as a pill of rhubarb or capsicum, just before dinner. To afford temporary relief, give a few grains of bicarbonate of soda, about an hour after meals. Let the drink be water, and if a stimulant be required, a little brandy or sherry well diluted. In that form of heartburn or cardialgia which occurs in nervous per-

sons and in depressed states of the system, to afford temporary relief give a little carbonate of soda after meals, with bismuth, hydrocyanic acid, or morphia; but a permanent cure can only be effected by invigorating the system by preparations of valerian, iron, and quinine. If pyrosis be present, we can check it by astringent medicines, as bismuth, kino, &c. Nitrate of silver, or nux vomica, as recommended by Dr. Budd, are very useful. If the diet has been too poor we must improve it before we can expect any change. This symptom is often accompanied by severe pain, which is best relieved by sedatives, as hydrocyanic acid, with which a little carbonate of soda may be combined. In all cases of dyspepsia no medicines can effect a cure unless great attention be paid to diet, which should consist of plain dressed animal food, chiefly roasted, and eaten slowly with a small proportion of well-boiled vegetables. Fat, fried, baked, or stewed meats should be avoided, also pastry, salads, acid or dried fruits, pickles, fermented liquors, and rich fish, as salmon or herrings. Sedentary habits should be avoided. (Dr. Lees, p. 98.)

A sense of fulness or flatulence of the stomach after meals will be prevented by taking a pill of four grains of rhubarb with one of capsicum before meals. If the patient loathes the sight of food, give sulphate of quinine or pepsine. If the dyspepsia be accompanied by much debility and nervous irritability, sulphate of zinc in doses of a grain, gradually increased, given three times a day, as recommended by Dr. Golding Bird, will be of most value. (Dr. Lees, p. 106.)

Instead of the insoluble subnitrate of bismuth, use the subcarbonate, which is readily soluble in the gastric juice, and neutralizes the acids which are found in excess in the stomach, in which respect the subnitrate fails. The subcarbonate seems to be sedative in its action during the first days of its employment, and subsequently to have a tonic influence. It is peculiarly suitable in cases of dyspepsia in which the tongue is red and pointed, or the digestion laborious, and accompanied with putrid or acid eructations. In the vomiting and diarrhœa of children it is of much use. It should be given before meals, and is perfectly insipid. (Prof. Hannon, p. 401.)

Eructation and Vomiting.—When from simple relaxation of the œsophagus give astringents, as gallic acid combined with a little rhubarb. When from excess of air, swallowed from irregular nervous action, as in hysteria and chorea, give valerian, either in infusion of the herb or combined with ammonia. When these fail give strychnine or creosote. The shower-bath is a very powerful remedy. When from the formation of foreign gases from chemical decomposition, no agent is so useful as sulphurous acid, which may be given as hyposulphite of soda; if this chance to disagree charcoal will scarcely fail to arrest gastric fermentation. When chronic vomiting

is sympathetic, *i. e.*, from some disease or condition elsewhere, as in peritonitis, pregnancy, &c., give hydrocyanic acid. When from gastric mucous flux, with copious formation of acid, give carbonate of magnesia. When the vomiting is accompanied by much local pain, as from gastric ulcer, malignant tumour, peritonitis, hernia, perforation of the gut, opium is the remedy of most value. When at the commencement of fevers and in cholera, apply chloroform on a cloth to the epigastrium. Milk and lime-water, as a sole diet, will often alone stop chronic vomiting; complete rest and absence from excitement must accompany it. Chloroform does not arrest the nausea of sea-sickness, but it controls the violence of the straining. (Dr. T. K. Chambers, p. 79.)

If vomiting be caused by some structural disease of stomach, as ulcer, scirrhus, &c., give a drop of creasote, or five or ten drops of medicinal naphtha, or a combination of bismuth with gallic acid and opium, as recommended by Dr. Turnbull. If caused by a morbid state of the blood, as in scarlatina, erysipelas, cholera, &c., our treatment must be chiefly directed to eliminate the "materies morbi" from the system by means of the skin and bowels. Vomiting may be from a mechanical cause, as from the violence of an habitual cough, or a stooping occupation. If vomiting be from a sympathetic cause, as disease in the womb or brain, or calculus in the gall duct, kidney, or ureter, we must endeavour to remove this, the origin of the vomiting. Thus it has been necessary in some cases to produce abortion, the life of the patient having been in danger from the long continuance of this distressing symptom. If caused by the passage of a calculus, either from the gall-bladder, or kidney, large doses of opium are required, the first dose combined with aloes and carbonate of soda. In some cases chloroform may be given with good effect. For the cure of nervous vomiting, that is, vomiting induced by some modification of innervation of the stomach, unconnected with any change of structure, a proper regulation of the mind is essential. A slight but continuous action must be kept up by some mild aperient medicine. In some cases, effervescing draughts, with prussic acid or laudanum will succeed; and in hysterical cases, assafœtida, valerian, and creasote will be found useful. When the patients are anæmic give iron with bitter tonics. External counter-irritation is often of much use. The diet must be very simple and easily digestible. (Dr. Lees, p. 388.)

Gastrodynia may occur. 1st, When the stomach is empty. This depends on acrimony of the digestive fluids; it is relieved by taking food, or by alkaline remedies, as aromatic spirit of ammonia or magnesia. 2nd, Immediately after taking food; then it generally arises from chronic inflammation, or morbid irritability; or, 3rd, It may begin from two to four hours after a meal; then it is generally from a similar state of the duodenum. (N.B. From the seat of the

pain do not mistake it for disease of the liver.) This will be best relieved by the administration of aloes, lime-water, bismuth, and opiates, combined with rhubarb. 4th, It may occur at uncertain intervals, in most violent paroxysms, with a feeling of distention, much anxiety, and great restlessness. This depends on over-distention of the stomach, or may sometimes be seated in the arch of the colon, and is best relieved by carminatives or by a strong injection. Hydrocyanic acid is a most valuable remedy in these cases, also opium, and hot stupes should be applied externally. (Dr. Lees, p. 101.)

Heartburn.—In anæmic feeble persons this is generally from over-sensibility of the nerves to the natural acidity of the stomach. This is relieved by alkalies—but alkalies prevent perfect digestion by neutralising the acidity necessary to a proper performance of the digestive function. The treatment must therefore be directed to almost the over-sensibility of the nerves, temporarily, by hydrocyanic acid and bismuth; permanently, by strengthening the general nervous system by quinine and iron, combined with sea-bathing, or the shower-bath. In other cases heartburn depends on too large an amount of acid being present in the stomach, resulting from chemical decomposition of the sugar in the chyme, owing to decreased vital power. The treatment here is to increase the power and vigour of the stomach. The activity of the pepsine may be much augmented by neutralizing the saliva collected in the stomach and œsophagus just before the meal, by a little hydrochloric or lactic acid; for the saliva arrests the solvent action of the gastric juice in a close proportion to its amount. The quantity of gastric juice may be further increased by supplying one of its most important constituents, water, which is best taken as cold as possible about half an hour after the meal. (Dr. T. K. Chambers, p. 73.)

Hemorrhoids, Internal.—M. Amussat applies to these a stick of destructive caustic by means of an ingenious instrument described and figured at p. 232. But as it may not be convenient to every one to obtain this instrument, the tumour may be seized with a pair of forceps, and a stick of caustic potash applied with a rotatory motion, so as to penetrate the hemorrhoid. The parts must be well washed after this. Nitric acid is a very suitable remedy where the prolapsus and bleeding hemorrhoids are small, but if larger, the free application necessary often causes severe inflammation and excruciating pain, and the relief is often only temporary. (Mr. J. Hamilton, p. 231.)

Method of Using the Ecraseur for.—The bowels having previously been well opened, place the patient under the influence of chloroform, and on his left side, the right leg and thigh being flexed. Draw out the hemorrhoidal mass, and include the whole within a firm twine ligature, along the track of which the chain of the écraseur

must be placed, and shortened till it constricts the tumour. The tumour must be very gradually removed, the chain being slightly tightened about every fifteen seconds. An almost bloodless surface will be left, on which the track of the wound will be scarcely discernible. Graduated pressure must be now maintained against the anal opening, by means of the usual perineal bandage, and the bowels locked up for seventy-two hours after. It will be necessary to pass up daily an oiled elastic bougie, gradually increased in size, to prevent adhesion, and so stricture of the rectum. (M. Chassaignac, Mr. R. J. O'Doherty, p. 408.)

Hernia, *Strangulated.*—Dr. Durand, of Havannah, has repeatedly succeeded in effecting the reduction of this, by giving the patient a cup of hot coffee every quarter of an hour. A case is related in which it succeeded, no application being made to the tumour, and the taxis having been employed in vain. (p. 231.)

Intestinal Catarrh.—In those cases of intestinal catarrh in children in which the mucous membrane becomes ulcerated around the anus, give an enema containing about a drachm of borax. (M. Bouchut, p. 424.)

AFFECTIONS OF THE BONES AND JOINTS, &c.

Amputation at the Ankle-Joint.—In performing this operation, after making an incision from malleolus to malleolus under the os calcis, as first suggested by Prof. Syme, make a straight incision at right angles with the first to the back part of the heel, on the outer side of the foot, a little above and parallel with its outer margin, between, therefore, the point of the outer malleolus and the margin of the foot. By this means the operation is considerably facilitated, and pus does not subsequently collect in the cup-shaped flap. The principal bloodvessels lie at the fore part and inner side of the ankle-joint, and beneath the foot. (Mr. R. Quain, p. 196.)

Artificial Legs.—The pin should not be placed in the centre of the stump, but more anteriorly, i. e., in the same position as the tibia should occupy in the normal limb ; and in order to obtain elasticity at the point corresponding to the ankle-joint the weight should be transferred from the pin to an arched foot. These weight-bearing parts may now be covered with pliable leather, stuffed with cotton wool, in order to imitate the shape of a perfect limb. (Mr. K. Cornish. p. 204.)

Dropsy of the Knee-Joint.—Provided that the case be one of simple uncomplicated chronic dropsy, Dr. Macdonnell's plan of injection with iodine will probably prove successful. The puncture should be made at the part most remote from the joint. If the sac is very large the injection should not be used directly after the first tapping, but time should be allowed for the sac to collapse somewhat.

When the injection is going to be used, apply a wet bandage from below the knee upwards to a level with the upper edge of the patella, so as to push the remainder of the fluid above the joint into the pouch of synovial membrane. When the fluid is drawn off, inject about two drachms of the strongest tincture of iodine, with an equal quantity of lukewarm water. Allow this to remain, moving the joint a little, that the fluid may be diffused. The wet bandage must now be carried further up the limb, the aperture being first closed with adhesive plaster. A long padded splint should be afterwards applied. (Dr. R. Macdonnell, p. 190.)

Flap Amputations.—Cut from without inwards, but at first only down to the fascia, to allow for the greater retraction of the skin than of the muscles. Separate these superficial flaps from the subjacent muscles to a sufficient extent; then divide the latter by two incisions so as to form flaps. In the after-treatment of the part, Mr. Paget bandages the stump from above downwards, the soft textures being at the same time drawn by an assistant over the ends of the bone. (Dr. J. Sloane, p. 161.)

Excision of the Elbow-Joint.—There are two objects to be attained by this operation, viz.: First to remove all the diseased bone, and second, to do this in such a way that a useful and movable joint may result. It is always far better to remove the whole of the articular surfaces of the joint, than to remove the diseased portion only, for the disease often extends afterwards to the other bones; and there is often more suffering and fever than when the whole is removed. The mode of performing the operation will be found minutely described in the volume. (Mr. E. R. Bickersteth, p. 198.)

Excision of the Hip-Joint.—After the performance of this operation a swing should be used, sufficiently strong to suspend the entire body. The wound should be left uncovered, except by the dressings, in order to secure a depending escape for the discharge. By this means there is no necessity to disturb the patient to allow of the evacuation of the bowels, and the accumulation of the discharge from the wound is prevented. (Mr. Heath, p. 181.)

Osteotrite.—For the removal of carious bone, either from the surface, or from the interior of cavities, use the osteotrite, invented by Mr. Marshall; it consists of a handle similar to that of the common gouge, into which is fixed a steel shaft, terminating in a round somewhat conical head, which varies in size, but which possesses a series of spiral cutting edges, radiating from two points on the sides of the vertex. It is used by a rotatory motion, and cuts like a saw or rasp, and removes diseased structure with perfect ease. It does not leave behind it any loose splinters, and from its strength is not liable to break or slip. (p. 203.)

Paper Splints.—In the treatment of fractured legs, after the swel-

ling has subsided, apply paper splints made by adapting in successive layers strips of brown paper smeared with thick paste. This soon hardens, and a bandage may be lightly applied over it. The whole forms a very light hard case, enabling the patient to leave his bed at the end of ten days or a fortnight; and it is impossible to cause over-pressure, as the starched bandage may do, for the paper tears if pulled too tight. (Mr. J. C. Savery, p. 206.)

Plaster of Paris Bandage.—In cases where the ordinary starch bandage is used at present, the plaster of Paris bandage may be advantageously substituted, as it is lighter and dries quicker, and hence is less liable to be spoiled by the patient's movements during the time of drying. It is made by rubbing dry plaster of Paris well into an ordinary bandage. The patient's limb is first enveloped in a roller, and over this the plaster of Paris bandage slightly wetted is applied. As each turn is laid on it is more thoroughly moistened, and then lies quite evenly and comfortably. Additional strips may be laid on, and supported by turns of the principal bandage at any parts where more pressure is required. (Mr. Erichsen, p. 404.)

Resection of the Knee-Joint.—There is a great practical distinction between strumous diseases of the knee-joint, commencing within the cavity of the articulation, and those originating in the cancellous structure of the heads of the bones entering into the formation of the joint; for every diseased joint, with the exception of that form of diffuse strumous infiltration of the heads of the two bones, is, in general, well suited for the adoption of resection in preference to amputation. The surgeon should not always decide which operation he will perform, till he has obtained a clear view of the state of the joint. (Mr. P. C. Price, p. 185.)

Talipes Varus.—The theory of stretching the new material formed in the reparation of tendon, after division by the knife, is altogether erroneous. The new material does not admit of being stretched like india-rubber, and then, unlike this material, of being retained at any required length. Our object must therefore be to regulate the length of the new material during its formation. In *slight* infantile cases, divide all the tendons necessary at one operation, and after the foot has been retained in its deformed position by a bandage and splint for three days, apply Scarpa's shoe, and in the course of two or three weeks bring the foot into its natural position. In *severe* cases the treatment, both operative and mechanical, must be divided into two stages; the first to overcome the inversion of the anterior part of the foot, and thus convert the case into one of equinus—the second stage to cure this equinus. The first stage is accomplished by dividing the tendons which invert the foot, and then the cutaneous punctures being healed by the application of a bandage and splint to the outer side of the leg and foot, gradually to produce eversion. The second stage is accomplished by division

of the tendo-Achillis, and then by the use of Scarpa's shoe, to produce flexion at the ankle-joint. If at the end of the fourth or fifth week the tendo-Achillis should still appear to be strong the shoe should be worn only at night, and the frequent and regular employment of passive motion is more to be relied on than any mechanical aid. (Mr. W. Adams, p. 206.)

In all *relapsed cases* of talipes varus, in which the deformity can be removed, the relapse is owing to some defect in the after-treatment. Among defects in the primary treatment are, omission of the division of the posterior tibial tendon, division of the tendo-Achillis at beginning instead of at the end of the operative treatment. Among defects in the after-treatment are omitting the use of such retentive mechanical means as the case may require, and of active and passive muscular exercise, in the right direction. The earlier the treatment is commenced the less is the tendency to relapse. In very rare cases there is a congenital defect in muscular development. Here some form of retentive apparatus must be worn by the patient during the remainder of life. In the treatment of these cases where any marked degree of inversion remains, and is accompanied with rigidity of the foot, treat the case throughout as if nothing had been done. In most cases division of the tendo-Achillis, or of this and the plantar fascia will suffice. (Mr. W. Adams, p. 211.)

Unnecessary Orthopœdic Operations.—Operations are resorted to too frequently in the cure of talipes varus. As a consequence, though doubtless the cure is more speedy, we have various permanent ill effects which might have been avoided. Thus, the fleshy part of the calf is too small and too high up in the leg from contraction of the muscle, and the free motion of the ankle-joint is impeded by the prolonged rest which has been necessary to the success of the operation. Where, then, the foot can be abducted by the hand of the surgeon, and whilst so abducted can be bent to a right angle, by the use of gentle violence, a cure may be effected without tenotomy, before the usual age at which sound children attempt to walk, and even if an operation be performed, mechanical treatment cannot be dispensed with before this age. When the surgeon cannot perform this movement with the child's foot, and the imperfectly developed os calcis seems tied to the back of the tibia and fibula by deep ligaments, and a deep depression exists between the great toe and heel on the inner side of the foot, the case cannot be cured without operation. The secret of curing the case without operation consists in applying the bandage and splints (which may be made of gutta percha, moulded leather, or tin) so as not to distress the infant. They should be removed at least three times a day and manipulation practised, and reapplied more with a view of pre-

venting relapse into a wrong position than of forcing the lapsed part into a better one; and during this treatment recollect first to obtain eversion of the point of the foot before attempting depression of the heel. Although a case may be apparently cured, yet in the course of time deformity may again return owing to the muscles and other textures on the originally contracted side of the limb not keeping pace in growth with the other. Such cases can generally be restored by due pains in efficient instrumental and manipulative treatment. (Dr. W. J. Little, p. 217.)

AFFECTIONS OF THE URINARY ORGANS.

Diabetes.—The essence of diabetes is an arrest of the normal changes taking place during the digestion of starchy matters at their second stage, or that of conversion into sugar, the cause being a deficiency or vitiation of the digestive fluids. Now, if this cause can be obviated or removed, we have a partial or total disappearance of sugar from the urine. We have in rennet or pepsine a remedy which effects a healthy digestive process in an unhealthy viscus. Under its use the sugar partially or entirely disappears, and there is consequent improvement in the condition and health of the patient. (Dr. D. Nelson, p. 152.)

In a case lately treated by rennet the average quantity of urine voided fell from 10·108 to 6·988 cubic centimetres. The rennet had been administered twelve days, when, from some non-specified cause, the patient suddenly died. The diet was not altered in order that the results of the experiment might be as accurate as possible. (Dr. Iverson, p. 154.)

Hydrocele.—Puncture the swelling with a common darning needle, which rotate about for a few minutes, and the fluid will thus be allowed to escape into the cellular tissue of the scrotum, whence it will be speedily absorbed. This is perfectly simple and almost painless, and in a tolerably large number of cases a permanent cure will follow. (Mr. E. Stanley, p. 249.)

Hydrocele-Photoscope.—When the translucency of the swelling is made a means of diagnosis, much trouble may be avoided by using a tube of tin about 7 inches long, $1\frac{1}{4}$ in diameter at its larger end, and tapering to $\frac{3}{4}$ at the other, where it is furnished with a wooden eye-piece. It must be blackened inside. In sunlight a candle can be thus dispensed with. (Mr. J. C. Savery, p. 249.)

Incontinence of Urine.—Belladonna in doses of one-twelfth of a grain of the extract, about three times a day, will be found to have a most marked and beneficial effect in some cases of incontinence of

urine. A case is given where it succeeded after everything else had failed. (Mr. G. B. Masfen, p. 160.)

Retention of Urine.—If a catheter cannot be passed, place the patient under the influence of chloroform; if the stricture be spasmodic it will be at once relaxed, and even if a permanent one, will often be relaxed so far as to admit of the passage of an instrument. (Mr. J. C. Förster, p. 248.)

Stricture of the Urethra.—If it be inflammatory stricture from severe gonorrhœa, the mucous membrane of the urethra being swollen, and the muscles surrounding it in a state of spasm, pass a rather small elastic catheter at once; but if the case be not severe, you may modify your practice: put twelve leeches to the perineum, place the patient in a warm bath, give him an ounce of castor oil, and thirty drops of laudanum on it, and he will pass his water either in the bath or when the oil operates; and cases of permanent stricture may generally be relieved in the same way, no instrument being used at all. But the cure of permanent strictures must be accomplished by promoting the absorption of the superadded tissue, by the pressure exerted by means of the catheter. You must not mind being foiled on the first attempt to pass it. (Mr. J. Adams, p. 239.)

Prof. Syme says, with regard to the use of external incision in the treatment of stricture that it is not true that wounds of the urethra, like those of the skin, must heal either by adhesion or granulation, and so the old contraction be restored with greater firmness than before. It has been repeatedly shown that the most tightly contracted urethra may remain perfectly patent after division of the stricture, and in the bodies of some persons who have died several years after the operation, the canal has been found actually wider than natural, and the surface of the previously deranged mucous membrane not distinguishable from the neighbouring portion. (Prof. Syme, p. 236.)

In extremely tight strictures use a tapering bougie of Berlin silver, very much attenuated towards the extremity, which is slightly probe-pointed, discarding fine elastic gum and catgut bougies, which are unreliable instruments. (Prof. Syme, p. 248.)

When so extremely narrow that no ordinary sound or catheter will pass, use a probe-pointed catheter. Its last two inches are made perfectly solid, and thus the extremity can be made of any size or form desired. About two inches and a half from the end the channel begins, and the small eye is placed. Finally, the whole is strengthened by a small steel rod or stilet, which accurately fills the interior, and to which the handle is fixed and the rod screws in.

The handle being removed with the stilet, it is easy to screw in its place a small steel rod, and slide over it a fine gum-elastic tube made of silk into the bladder if desired, after the solid instrument has been retained a few hours. (Mr. Henry Thompson, p. 245.)

AFFECTIONS OF THE SKIN.

Boils and Carbuncles.—The manner of opening by incision is neither requisite nor safe, and is much surpassed in efficacy by the use of potassa fusa for this purpose. It should be fresh, and unaltered by exposure to the air, and may be inserted into a goose quill by way of handle. The best time for opening, is when the skin has become dusky, and is perforated by pin-hole orifices, whence issues an ichorous oozing. To prevent the caustic running and destroying healthy skin, a dossil of dry flocky lint should be applied upon and around the part, to which the caustic has been applied. The carrot poultice is the best that can be applied afterwards, with a view of cleaning the sore, and a solution of chlorinated soda, is very useful at particular stages of the sore. A weak caustic, like nitrate of silver, is of no use, but even prejudicial in these cases. (Mr. B. Travers, jun., p. 258.)

Chronic Eczema *in Children*.—First get the scabs or crusts separated, by means of poultices, if the spots are limited, and are not settled on the head, face, and neck, where these applications are not suitable. Before applying them, it is a good plan to moisten the surface with a solution of carb. of soda, (℥ii. to ℥viii.) When the surface is large, a water dressing is to be preferred: a little subcarbonate of potash being added to the water. If situated on the head, face, or neck, paint the scabs over with a mixture of carb. of soda and cod-liver oil, removing the crusts carefully next morning, and moistening the surface with the alkaline lotion. This must be repeated as often as necessary, till crusts cease to be formed, and a red, inflamed, but painless surface is left. Next, we must remove this condition of the skin. One of the best means to this end, is the application of a solution of ℥i. of acetate of zinc, and the same of acetate of lead, in ℥viii. of distilled water, adding to this at the time of using it, an equal quantity of strong chamomile infusion. The last indication is to restore the activity and healthy tone of the skin, by such hygienic measures as fresh country air, free exercise, a well regulated and wholesome diet, and such local applications as weak solutions of alum, and sulphate of zinc. (Dr. Behrend, p. 255.)

Cicatrices from Burns.—Make a number of short transverse incisions in the cicatrized tissues; these gape much when made. The wounds are dressed with narrow pieces of strapping, so as to approxi-

mate the ends of a cut to each other, not the sides—and lengthen out the old cicatrix as much as possible. (Mr. F. C. Skey, p. 254.)

Plastic Operations.—*For Restoration of the Lower Lip.*—Two vertical incisions, about three-quarters of an inch in extent, are made through the everted lip down to the bone. These incisions are so placed as to divide the upper portion of the everted lip into three parts—the middle being equal to one-half of the natural breadth of the lip, while the two lateral portions are each equal to one-fourth. From the lower end of each vertical incision the knife is carried in a curving direction outwards and upwards to a point situated about one inch from the angle of the mouth opposite to the second molar tooth of the upper jaw. The two flaps thus marked out and deeply incised are then separated from the bone, the mucous membrane uniting them to the alveoli being freely divided. Lastly, a bare surface is made along the alveolar border of the middle portion of the everted lip. The incisions being now completed, the lateral flaps are drawn upwards and united by twisted sutures to each other in the median line, and to the middle portion of the everted lip at their inferior border. In this way a new lip is, as it were, built upon the middle portion of the old one. (p. 251.)

Upper Lip.—A crucial incision is made *(en sautire)*, having its point of intersection immediately below the septum of the nose. Each limb of this incision is about one and a half inch in length. The two limbs on each side diverge moderately as they pass outwards to the cheek, and enclose between them an acutely angular flap of skin and other tissues. This crucial incision is extended deeply through the entire substance of the imperfect lip and the cheeks. The parts implicated in the incisions are then freely loosed from their attachments to the superior maxillary bone by the knife being passed upwards between the bone and the remnant of lip. The parts being thus detached, the two lateral angular flaps are drawn across the median line, dovetailing with each other, and thereby increasing the depth of the lip at the expense of its breadth. In this position the flaps are retained by one pin and twisted suture. (p. 252.)

Contractions of the Neck.—In cases where the chin is drawn down to the sternum divide every band of adventitious fibrous tissue beneath the scar, until the bottom of the wound discloses a loose, healthy, cellular tissue. A piece of sound skin must now be transplanted to this wound from the neighbouring parts. Avoid very accurate adaptation of the flap by suture, as great tension renders it liable to slough. When the scars are very numerous or extensive, it is better to repeat the operation, rather than do the whole at once. (Mr. T. P. Teale, p. 250.)

Scabies.—The diagnosis of this disease is occasionally difficult, it will be much facilitated by the knowledge of the fact, that the ova

of the acarus may be readily found with the microscope, attached to the roughened and undermined cuticle in the neighbour hood ofhe vesicles. (Dr. Gull, p. 262.)

Ulcers, *Old Callous.*—If an ointment consisting of anhydrous sulphate of zinc, mixed with glycerine, spread upon bits of lint the size of the ulcers, be applied to them, and allowed to remain a few hours, most acute pain will be caused, and the ulcer will be corroded; but when the slough separates, the granulations will rapidly spring up to a level with the surrounding parts, and in most cases will soon become skinned over. The sulphate of zinc is as suitable, but not superior to the chloride for this purpose. (Dr. E. Watson, p. 364.)

VENEREAL AFFECTIONS.

Chancre.—Apply pure acetic acid by means of a glass tube thoroughly to the part, preventing its diffusing itself around by means of charpie. On the third day a whitish eschar separates, and a clean healthy sore is left, which will rapidly heal by common dressing. On the first and third day an active purgative is administered. (Dr. Collmann, p. 274.)

Gonorrhœa.—Evans, Rose, and Guthrie, during the Peninsular war, in a situation peculiarly adapted for observation, came to a knowledge of this fact—that the catamenial discharge in the one sex will produce gonorrhœa in the other. Mr. Evans was sure also that the ordinary secretions of the female will produce even venereal disease. (Mr. F. C. Skey, p. 262.)

Gleet and Gonorrhœa.—Give your patient an injection of half a grain of sulphate of zinc to an ounce of rose-water, about five times a day. Keep up his system with tonics, allowing his usual diet, unless egregiously faulty, and banish purgatives, antimony, &c. Administer internally the tinctura ferri or ferrocitrate of quinine, and the balsam copaibæ in small doses only. (Mr. F. C. Skey, p. 264.)

Syphilis.—No mode of mercurial treatment removes the symptoms of syphilis so readily as fumigation; none is attended with so little mischief to the patient's constitution. and after none is a relapse so seldom experienced. Calomel is the best preparation to use for the purposes of fumigation; it is readily sublimed—is not decomposed thereby—and but a comparatively small quantity is required. It is found to answer the purpose better if combined with vapour of water; therefore, in any lamp used for this purpose, provision must be made not only for volatilizing the calomel, but a small amount of water likewise. (Mr. H. Lee, p, 268.)

Secondary syphilis may be treated entirely without mercury, and on the following simple plan; and not one in a hundred instances will return with constitutional symptoms. Stomachic and tonic

remedies must be administered, conjoined with a good diet and the following formula, viz:—Sulphur, one drachm; sulphuret of antimony and nitrate of potash, of each five grains; mixed into a powder, half of which must be given night and morning, and persevered in till a cure is established. (Dr. Marsden, p. 274.)

AFFECTIONS OF THE EYE AND EAR.

Artificial Pupil.—A very useful instrument is employed by Mr. Bowman in these cases, consisting of a needle-pointed hook, which enables the operator to enter the cornea, and drag out the iris with the same instrument: thus there is less chance of the escape of the aqueous humour, and a very small opening is made. There is no difficulty in withdrawing it. A little care is necessary lest in using the hook the lens be wounded by the needle point projecting beyond it. It is peculiarly adapted to cases where extraction has previously been performed. (Mr. W. Bowman, p. 285.)

Belladonna.—When used to dilate the pupil, the extract gets hard and contracts, producing a disagreeable tightness: this may be avoided by mixing it with a little glycerine. (Mr. J. C. Savery, p. 289.)

Cataract.—A single cataract of soft consistence occurring in an eye otherwise healthy should be submitted to an operation for its cure. Confusion of vision seldom results, and when present is susceptible of correction by an optician's lens. (Mr. J. V. Solomon, p. 286.)

Linear Extraction of Soft Cataract.—Provided that the lens is soft and without a nucleus, it may be removed at once by the method adopted at the Moorfields Hospital in such cases, and there called linear from the corneal incision being a line more or less in width. With a broad needle, make a puncture on the outer side of the cornea, about a line in width, and with the same needle lacerate the capsule and break up the lens. A channelled curette must now be introduced, through which the fluid part of the lens may escape. By a little manœuvring the capsule itself may be passed into the aperture, and, being seized with the forceps, may be bodily removed. (Mr. Critchett, Mr. Bowman, p. 285.)

Eustachian Tube, *Obstruction of the.*—When the tympanum is healthy, obstruction of the eustachian tube from a thickened and congested faucial membrane, can in several cases be removed by general measures. The patient must take abundant and active exercise in the open air. the throat must not be wrapped up closely by handkerchiefs, flannel should be worn next the skin, and the patient should have a cold plunge bath every morning, though, if it be a young child, the body may be rubbed instead with a coarse wet towel. The most efficient local treatment is the application of the

nitrate of silver. This is best applied in the solid form, and a holder can be contrived so as to be bent at such an angle that the caustic may be applied directly to the opening of the tube. Though temporary benefit is derived from the use of the eustachian catheter, yet its effects being rather to increase the congestion, its use should be avoided. But if after a time no benefit be derived from the above general and local treatment, the catheter may be introduced once, as it may facilitate a cure by removing mucus from the tube, or by separating the lips of the faucial orifice. (Mr. J. Toynbee, p. 290.)

Ophthalmia, *Purulent.*—During the acute stage, you may 1. Deplete locally by leeches. 2. Scarify the inner surface of the lids. 3. Divide the external canthus, or scarify the occular conjunctiva in radii, if chemosis is high. 4. Apply nitrate of silver drops, the strength varying according to the severity of the symptoms. 5. Foment constantly with decoction of poppies, containing a little alum. 6. After the bowels have been well opened, for which purpose croton oil is the best, as being the most speedy purgative, exhibit mercury, which must be used guardedly if ulceration threaten the cornea. 7. Give quinine where debility prevails. 8. Moderately nutritious diet should be given, and progressively improved. In the convalescent or chronic stage, tonics with varied and mild local astringents and slight counter-irritation must be used to complete the cure. The above is the treatment adopted at Guy's Hospital. (Mr. J. F. France, p. 275.)

Strumous.—Should intolerance of light, deranged digestion, and other symptoms of the appearance of this disease came on in a young child, avoid all depleting measures, and give tonics, as quinine and iron, with fresh air and exercise, simple and nutritious diet. An acute attack is sometimes brought on by crude and indigestable food, the stomach must then be emptied by an emetic, and the action of the bowels and skin be promoted. A leech or two may be applied to the temples. Stimulating eye drops should be avoided in the early stages of these affections, the eyes should rather be steamed or bathed with warm and slightly anodyne applications. The difficulty experienced in obtaining a good view of the eye from the spasmodic contraction of the orbicularis muscle may be overcome by placing the patient under the influence of chloroform, and by this means nitrate of silver may, if necessary, be applied to the minutest ulcer. Besides bark and quina, the muriate of baryta is an alterative of much power. it may be combined with the tincture of sesquichloride of iron. The syrup of the iodide of iron is also a ferruginous preparation peculiarly suited to this class of diseases. Of local applications, nitrate of silver is the most generally useful. it may be combined with small quantities of wine of opium, or tincture of belladonna, but must not be continued too long, lest

it should discolour the cornea. The best remedy for the intolerance of light, is prussic acid; Scheele's preparation reduced to half its strength by the addition of distilled water, or mixed with wine of opium. An excellent counter-irritant in these cases, is tincture of iodine. it should be painted over the upper lid only, as it will be washed off the lower one by the tears. In chronic cases, the child must go out of doors regularly, but in acute cases, confinement to the house is necessary. (Dr. H. Thorp, p. 276.)

Sulphate of Atropia.—This salt is preferable to the pure alkaloid for therapeutical purposes, but the absorption of the solution if strong, (such as five grammes to the ounce of distilled water,) must be guarded against. Its application is peculiarly soothing in painful inflammatory states of the eye, the intolerance of light and abundant lachrymation being much relieved. (Dr. F. Mosler, p. 289.)

MIDWIFERY AND THE DISEASES OF WOMEN.

Artificial Maternal Milk.—The maternal milk differs from the cow's, principally in containing less caseine or curd, and more lactine, or sugar of milk, and from ass's milk in containing a little more curd and butter. Therefore a very perfect substitute for maternal milk, may be made by adding about two and a half per cent. of cream to ass's milk, or by removing a portion of curd from cow's milk, and adding a little sugar. (Mr. Lobb, p. 331.)

Fibrous Tumour of the Uterus.—In a case of fibrous tumour of the uterus, very successfully operated on by Mr. Teale, of Leeds, the following was the plan of operation:—The long midwifery forceps were first applied to the tumour, which was gradually drawn fairly beyond the external parts, bringing along with it the inverted womb. An incision was now made through the investing membrane round the basal portion of the tumour, and the mass detached by enucleation. The womb was then reduced by the hand (Mr. T. P. Teale, p. 342.)

It is impossible to give rules for all cases which may occur, the first incisions must be very free, the tumour being well depressed into the pelvis by an assistant. Next, the separation of the tumour from its capsule must be effected by means of the finger, or by blunt-pointed curved scissors, the finger being used as a director. The grand object for the operator, after having separated the tumour from its cyst wall, sufficiently to allow of its lower part being seized, is to invert the uterus, and drag that viscus, together with the tumour, to the external parts, that its remaining attachments may be cautiously separated. This having been accomplished, and the everted uterus returned, a sponge plug may be introduced and a full dose of opium given. Small doses of

turpentine are of much use in that form of low inflammation of the pelvic organs or peritoneum which not unfrequently follows. (Mr. J. Hutchinson, p. 336.)

Ovariotomy.—A large incision is much preferable to a small one. A small incision does not afford sufficient space for ascertaining the extent and relations of the adhesions of the tumour, nor for the necessary manipulations. Though a mobile tumour is preferable for operating, yet the presence of adhesions is not of much importance. If well organized, the adhesion must be left on the peritoneum and the free portion of the sac cut away around it. In ordinary cases the pedicle of the tumour may be secured with a single ligature, but if it be thicker than the finger, it is necessary to transfix it with a double one, and the ends of the ligature must always be left depending from the lower extremity of the wound. Opium plays the chief part in the after-treatment, the principal indication being to keep the bowels locked up for three or four days. Chloroform is of the greatest use, and has no subsequent bad effects. The tumour should be tapped three or four days before operating. Dr. Clay has now operated on seventy-nine cases of ovarian tumour, fifty-five of which have been successful. (Dr. Clay, p. 334.)

Placenta Prævia.—In those terrible cases where the os is rigid and unyielding, and the flooding profuse, do not delay, but introduce one or two fingers through the os, and detach all that part of the placenta which adheres within the cervical zone, or region of dangerous placental seat. The contraction of the womb present in such a case as this is the very element which will secure the success of this operation, as it constricts the mouths of the bleeding vessels. If contraction is not present, it must be induced by ergot of rye or galvanism. By the performance of this operation, moreover, the os and cervix are released from a mechanical impediment to dilatation. If necessary, the hæmostatic process may also be assisted by the use of the plug. By these means the hemorrhage will have been arrested in the great majority of cases, but if not, time will have been gained, and forced delivery rendered more easy. (Dr. R. Barnes, p. 306.)

Prolapsus Uteri.—Having made the usual horse-shoe denudation in the operation for the cure of this disease, Mr. Fergusson applies the common interrupted suture instead of the quill suture, which is generally used. Mr. Fergusson believes that the quill suture sometimes causes tendency to sloughing from over-pressure. (Prof. Fergusson, p. 331.)

Puerperal Fever.—In this disease Dr. Copland says,—"There is no remedy so efficacious as a decided and judicious use of spirits of tur-

pentine." The same author also recommends camphor in doses of from eight to sixteen grains; but by far the most important question is the prophylaxis of this disease. All bad or imperfect drainage must be avoided, and no medical man should attend a case of midwifery after making a post-mortem examination without first washing his hands, and especially his nails, in a solution of chlorine. We must recollect that the inflammation is owing to a poison, and our treatment must be directed rather to destroy or remove this poison, than to combat the inflammation. (Dr. E. W. Murphy, p. 323.)

Suppression of Milk.—If from any cause the lacteal secretion should become suppressed, and it is desirable to again renew it, it may be accomplished by the application of electricity. (M. Becquerel, p. 328.)

Uterine Polypi.—For the removal of these tumours an instrument lately invented by Dr. Aveling, of Sheffield, will be found very useful. It consists of a long curved stem, at one end of which is a hook, and fitting into the concavity of this is a plate of metal, which by a screw in the handle is capable of being withdrawn lower down the stem. When used the plate is screwed half way down the stem, and the instrument is passed up so that the hook may be round the peduncle of the tumour: by means of the screw the plate of metal is now forced up into the concavity of the hook. Thus the tumour is removed, without the disadvantages of either the knife or the ligature; viz., of the former, hemorrhage, which is here avoided, as the peduncle is not divided by a cutting but by a *crushing* action, and of the latter, the fetid discharge caused by the putrefaction of the polypus. (Dr. J. H. Aveling, p. 343.)

There is no class of tumours in which the écraseur is likely to prove more valuable than in these. The dangers resulting from the other modes of removal are avoided, viz., inflammation of the veins, secondary abscesses, &c., if the ligature be used, and hemorrhage if the more speedy knife be employed. The great and only objection to the écraseur in these cases is the difficulty of applying the chain high enough up, so as to include the base of the tumour: this is in a great measure overcome by seizing the polypus with a hook and dragging it lower down. (Mr. G. M. Humphry, p. 345.)

Varicose Veins, *Ligature of in Pregnancy*.—It has been shown by the results of a case of Mr. Erichsen's at University College Hospital that *even* during pregnancy (should such a procedure be necessary from dangerous hemorrhage) varicose veins may be safely liga-

tured. Mr. Erichsen's method, it will be recollected, consists of placing pins under the veins, and tying them over a piece of gum elastic bougie. (Mr. Erichsen, p. 229.)

Vesico-Vaginal Fistula.—When ligatures are used in operations for this disease, penetration by them of the *vesical* mucous membrane must be carefully avoided. (Dr. J. H. Sawyer, p. 333.)

MISCELLANEA.

Ammonia.—Dr. Richardson's recent discovery, that healthy blood owes its fluidity to the presence of ammonia, which is given off during coagulation, and which process may be arrested and the fibrine redissolved by the restoration of the alkali, suggests the utility of ammonia in all diseases accompanied by or depending on effusion of fibrine, as croup, diphtheritis, erysipelas. Thus ammonia has two actions—primary stimulant, secondary debilitant. Its stimulant powers in hysteria, ague, syncope, poisoning by hydrocyanic acid, are too well known to need mentioning. Of all the salts of ammonia, the hydrochlorate is the most useful when its antifibrinous property is required. (Dr. T. Ogier Ward, p. 385.)

Bran Bread.—In very hot weather it is better to make this extremely useful article of food for diabetic patients without the soda and acid, and in four or five cakes rather than one loaf. (Mr. Camplin.) [An account of it will be found at p. 425 of our last volume.]

Chlorodyne.—This agent given internally in doses of about twelve minims in a little water is a most pleasing anodyne. Its effects last for several days. It is particularly useful where opium cannot be tolerated. (Dr. Henderson, p. 423.)

Chloroform.—*State of the Pulse.*—The finger of the practitioner should be kept constantly on the pulse from the moment when inhalation begins, and from this alone can the amount and duration of anæsthesia be regulated with perfect safety to the patient. Should spasm or rigidity of the muscles prevent the pulse being distinctly felt, the inhalation must be instantly stopped, until the spasms subside. Should the pulse become irregular or intermitting, which, however, is very rare, inhalation should be suspended. The volume of the pulse is of no value as a guide; unless the pulse falls very much in quickness its volume is seldom much affected. The velocity of the pulse is lessened by chloroform, especially if long

continued, and in large quantities. Double caution is necessary where much blood is lost during an operation: here also the pulse is the sole and unerring guide. (Dr. R. Dyce, p. 420.)

Cod-liver Oil.—The disagreeable taste of this oil may be masked by adding to it about 10 per cent of common salt. (M. Leperdriel, p. 411.)

Dental Surgery.—*The Electric Cautery* is a very safe, rapid, and effectual means of destroying the exposed pulps of decayed teeth. The construction of the cauteriser, and its mode of application, will be found described at p. 413. The cavity of the tooth having been well dried out and cleaned, and the mouth protected by a soft napkin, the platinum point is introduced into the cavity of the tooth, and then heated, which is preferable to heating it before introduction. The part is distinctly illuminated, and the pulp may be destroyed almost instantaneously. In the great majority of instances there is little or no pain beyond a momentary twinge. As a rule, the tooth should not be stopped on the same day as the electric cautery has been employed, but the cavity should be filled with a combination of morphine and mastick for a day or two. If the tooth should remain tender after the use of the cautery, it is better to wait till this has entirely subsided. (Mr. T. H. Harding, p. 411.)

Exposed and Diseased Dental Pulp.—The nerve may be either removed by means of some instrument to withdraw it, as a straightened fish-hook, or by destroying it entirely, or by rendering its exposed surface insensible: for the latter purpose a strong spirit solution of tannin may be applied, and the nerve becomes coated and protected by an insoluble compound formed by the albumen and tannin. As an escharotic for these purposes, nothing is better than four or five grains of recently burnt quick-lime, mixed with a grain of morphia: this should be taken upon a piece of wool, and placed on the pulp, and the cavity closed with wax. Next day the application may be removed, and if any tenderness remains the dressing may be applied again. A strong saturated solution of camphor is a good anodyne application. The actual cautery may often be used with great success to instantly destroy the dental pulp, as employed by Mr. Harding, whose paper on the subject will be found in this volume. (Mr. Underwood, p. 417.)

Ecraseur.—In Paris, many surgeons in using the écraseur substitute a soft cord of strong hemp, instead of the chain, as it is believed to cut with less contusion; and an instrument with a screw is said to be preferable to one with a lever handle. (p. 410.)

Electricity by Induction.—In tic douloureux, irritable breast, and sciatica, the most wonderful results have been obtained by the local use of electricity, and by these means the entire removal of muscular rheumatism may be fairly reckoned upon, even in protracted cases, and when all other means have failed. The tympanum has been electrified with success in nervous deafness, and in loss of smell or taste, the Schneiderian membrane, or the tongue and palate may frequently with success be subjected to the same process. In cases of involuntary stools and prolapsus ani, electricity may be applied to the rectum; or in paralysis of the bladder to that viscus itself. In cases of paralysis of the muscles of the pharynx, or aphonia, the pharynx or larynx may be electrified; and in cases of asphyxia from any cause, the electric excitation of the diaphragm may easily be effected by acting on the phrenic nerve as it passes over the scalenus anticus. By this means artificial respiration may be maintained in a body even sometime after death, the air rushing into the lungs with considerable noise. The modes of applying the electrical influence to each of these parts is given in detail in the article. (Dr. J. Althaus, p. 347.)

Friction.—Friction is applicable and of use in cases of local scrofulous disease, but only before symptoms of suppuration appear. It is also of much use in the subsidence of inflammatory action, and here the earlier it is resorted to the better, a good example being after inflammation of joints; in fact, whenever the circulation is languid friction is of use. (Dr. J. W. F. Blundell, p. 361.)

Lead Poisoning.—Persons who work much in lead, should use the bath daily, or if this be not obtainable, they should wash thoroughly the whole of the upper part of the body. The addition of about four ounces of sulphide of potassium to thirty gallons of water much increases the efficiency of the warm bath, causing a formation of sulphuret of lead. The habitual costiveness must be overcome by attention to diet, by the frequent use of injections, and by the administration of doses of sulphate of magnesia in infusion of roses. Iodide of potassium exerts a most powerful influence on the poison of lead; it should be taken fasting, that it may not be decomposed by acids, and it should be largely diluted. There is no evidence to show that sulphuric acid is an antidote to slow lead poisoning. The best means of purifying water from the contamination of lead, is by filtering it through sand and animal charcoal. (Dr. J. C. Hall, p. 60.)

Drop-Wrist from Lead-poisoning.—A case lately occurred at Charing-cross Hospital, of a printer who had been the subject of this affection for only two days, resulting from absorption of lead, owing to the tips of the fingers being denuded by constantly handling

new type. This case was cured completely in a week by the patient sitting with his hand in a solution of sulphuret of potassium (℥i. to ℥x.) for three hours three times a day. This acted from the great chemical affinities of sulphur and lead. (Dr. Hyde Salter, p. 45.)

Lead-Wire Suture.—In cases where it is desirable to place a suture to any part not easily reached, take a curved needle, and a piece of lead-wire which is very soft and flexible—the end of the needle must be so made that the wire may be screwed into it. Pass the needle through the edges of the wound, cut off the needle, and with a pair of forceps twist the two ends of the wire together, and double up the ends to prevent scratching. (Mr. Spencer Wells, p. 385.)

New Needle with Opening Eye.—To obviate the difficulty of holding the thread with the forceps and withdrawing the needle during the application of the quilled suture, used a curved needle, one side of the eye of which will open to allow of its ready removal from the ligature. This possesses all the advantages of the open eye needle without any of its disadvantages. (Mr. Spencer Wells, p. 403.)

Permanganate of Potash.—This substance in solution possesses the property of removing all noxious and fœtid odours, and in the solid form it possesses caustic properties. It may be used as a lotion, twenty grains to the pint, to ulcerated cancerous tumours, when it removes the fœtid odour and causes the place to assume a much more healthy character. In the solid form, it may be used to destroy cancerous masses. If a little of it, mixed with water, and spread over a plate, be placed in a sick chamber, all offensive odour will disappear. (Dr. G. F. Girdwood, p. 367.)

Pyrophosphate of Iron.—There is no tonic which acts so promptly and favourably as the pyrophosphate of iron and soda, prepared in a liquid form: it is easy to administer, rapidly absorbed, and does not produce fatigue to the digestive organs. (MM. Follet and Baume, p. 356.)

Strychnine.—*Detection of.*—Messrs. Rodgers and Girdwood, from a carefully conducted series of experiments, have come to the following conclusions:—that strychnine can be detected even when it has not been given in excess; that it is not decomposed in the body; that it is found unchanged in the urine; and can be detected in the blood, organs, and tissues of the body, quite independently of the contents of the stomach. It is more easily detected than any other poison, from the delicacy of its reactions, and

from its extraordinary stable qualities. The mode of conducting the analysis will be found at p. 397.

In a case of strychnia poisoning which occurred lately at Newport, it was incontestibly proved that the strychnia may, or may not, be found remaining in the stomach, according to the dose, &c., (in this case three grains); but not a particle of the poison in an absolute state may be found in other parts of the body, though the patient live five or six hours after its ingestion. (Prof. Taylor, p. 396.)

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PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

Art. 1.—ON THE VARIOUS FORMS OF MALARIOUS AND MALARIOID DISEASE.

By Dr. C. Handfield Jones, F.R.S., Phys. to St. Mary's Hospital.

The following review of one group of diseases may perchance aid some in obtaining a clearer view of their pathology, of the meaning of the various morbid phenomena they present, and of the mode of treatment that should be adopted in unusual and perplexing conditions.

It may be well to premise the following.

1. The sympathetic plexuses are given off from special ganglionic centres, having communications chiefly of the nature of commissural connections with the cerebro-spinal system. The ultimate ramifications of the plexuses are almost wholly made up of the special sympathetic fibres, mingled with very few of the tubular kind. There can be no doubt that the sympathetic centres are capable of a distinct and independent action, apart from the cerebro-spinal.

2. The sympathetic plexuses are distributed on the arteries of the abdominal organs, the thoracic, and the cranial.

3. Paralysis of these plexuses dilates the arteries they accompany, and increases heat and tissue change in the locality where they are distributed; it establishes active hyperæmia, which in states of debility may pass into inflammation.

4. The arteries of the rest of the body probably receive vaso-motor nerves from the cerebro-spinal which accompany them; the former are of the same structure as the sympathetic, and it may be considered probable that a lesion of them would produce similar effects. I have found these vaso-motor nerves on careful microscopic examination, most distinctly, in the skin of the fingers and dorsum of the foot. There can scarcely be any doubt of their existence in other parts, but the search for them is very difficult on account of the subcutaneous fat and fibrous tissue.

5. The action of malarious poison is sometimes paralysing, at others irritating. Neuralgic pain, rigors, or convulsions, must be regarded

as signs of irritation; numbness, coma, or loss of muscular power, as signs of paralysing influence. These two effects may be produced at the same time in different nervous structures of the same body.

6. It is probable that the nervous system is specially affected by malarious poison; (*a*) because certain diseases of the head (otitis) produce paroxysms exactly resembling those of ague; (*b*) because neuralgia is a common result of its action and paralysis not unfrequent; (*c*) because means which arouse and invigorate the nervous system, such as cheerful excitement, ward off the disease, while all depressing emotions induce it; (*d*) because quinine, the best remedy for malarious disorders, acts on the brain, producing in over doses deafness and sometimes convulsions; and opium, a drug of positive cerebral action, is also efficient in some conditions of malarious disease; (*e*) because confirmed malarious disease especially prostrates and stupefies the nervous power, and because this is also often the effect of an incipient attack.

7. The greater prevalence of malarious disease at some periods than at others seems to be ascribable to the medical constitution of the year rather than to a greater production of poison. If the tendency is to high (sthenic) inflammatory disorder, there will be little of ague and kindred affections; if the tendency is to cause a lowered state of *vis nervosa*, if nervous affections predominate, then malarious diseases, or those that resemble them, will be common also. It is probable that the heat of tropical countries renders the endemic disorders so severe as they are, not only by its generating more and more powerful malarious poison, but by enfeebling the nervous system, diminishing its equilibrium and tone, and so rendering it more liable to *bouleversement*.

8. There seems reason to think that other poisons besides the marsh miasm may act on the nervous system in a very similar manner, producing phenomena almost or quite identical with those of true malarious disease. The poison of influenza certainly seems capable of doing this.

9. The type of disease which prevails at present appears to be very favourable to the occurrence of phenomena of nerve-disorder, either of a prostrating or irritating kind, and of such disorders of the vascular system as are in great measure referable to a debilitated condition of its own special nerves.

The phenomena of the first stage of a complete ague paroxysm are depressed action of the heart, contracted and pale skin, neuralgic pains, irritation of motor nerves (rigors), arrest of secretions, short and laboured respiration, cerebral debility. The temperature of the blood is rising, and congestion is taking place in internal organs. The vitality of the various organs is partially prostrated, as by a shock, and this has no small share in promoting the occurrence of congestions.

This stage may be replaced by an attack of convulsions, or by a profound sleep from which the patient awakes in violent fever.

All the above phenomena may be regarded as the results of a poisonous influence operating on the cerebro-spinal and sympathetic

nervous systems. This acts eminently on the solar plexus, occasioning a sense of debility and distress about the epigastrium, paralyses the various plexuses which are offshoots from the solar, as well as others which are formed by the abdominal sympathetic, from which result dilatation of arteries, increased heat of blood, and local hyperæmia. At the same time the cerebro-spinal system is affected, in some parts debilitated, in others irritated. The hemispheres of the brain are evidently weakened and enfeebled in their actings. The sensory nerves are irritated, giving rise to neuralgic pains, and the motor, being similarly affected, produce the rigors. The shrinking of the skin is produced by the contraction of some organic muscular fibres in its corium, as well as by the occlusion of its arterioles. The arrest of the secretions shows that the vital power of the organs producing them is impaired, or in abeyance. The action of the heart is in most cases directly enfeebled, just as the contractile coat of the arteries is; sometimes however, as described by Dr. Bell in cholera, and as I have seen in cardiac neuralgia associated with ague, it is rather enchained and embarrassed in its working by an abnormal, irritating stimulus. If death occurred during the latter state (which seems to be characterised by a distressing sense of cardiac oppression), I should expect to find the heart firmly contracted, as was observed in those dying of cholera by Virchow, and by Reinhardt and Leubuscher. The two latter observers mention that their examinations were made on those who died in the algide stage. The short and laboured respiration depends in part on congestion taking place in the lungs, but still more, I expect, on disordered innervation of the phrenic and other respiratory nerves. When the voluntary muscles and heart are deranged from their healthy action by disorder of their nerves as we have seen, it is only to be expected that the respiratory muscles should suffer in a like way. In the case of the cold stage being replaced by an attack of convulsions, or one of coma, it may be supposed that the morbid influence has operated with unusual force on the principal nervous centres devoted to voluntary motion in the first instance, and on the cortical substance of the hemispheres in the second.

The phenomena of the second stage are increased action of the heart, relaxation of the cutaneous arteries, paralysis of their vaso-motor nerves, the condition of other parts remaining about the same. The congestions commenced in the first stage are now apt to be increased as the blood stream is driven with force through relaxed arteries by a powerfully acting heart. Epistaxis, apoplectic effusion, intestinal hemorrhage, rupture of the spleen, may thus be produced. The relaxation of the superficial arteries is only an extension of the condition of the rest of the arterial system, but the increased action of the heart is the reverse. What is its explanation? What cause shall we assign for the central organ of the circulation being in so different a state from all the more peripheral? It is to be remembered that the occurrence of reaction is a step in the direction of recovery, it

indicates as is well known an effort of the vital powers against the depressing morbific cause. With reference to this, it may be suggested as probable, that the cause of the heart's acting vigorously, while the arterial system still remains relaxed and dilated, may lie in part in the difference of its contractile tissue, which certainly has a stronger and more vigorous life than the non-striated fibre of the arterial coats, and is therefore capable of recovering and resuming its activity sooner than they do. A still more efficient cause of the exaggerated action of the heart may be found, I think, in the elevated temperature of the blood, which acts upon it in the way of a stimulus. Exposure to moist heat, when cooling by evaporation is impossible, accelerates the pulse remarkably. M. James mentions that his own rose from 70 to 120 while he was immersed in an atmosphere charged with hot vapour, the temperature in the lower strata being 111·4°, and in the upper 118·4° Fahr. The same experimenter endured with little inconvenience a temperature of 176° Fahr., when the air was dry. One cannot aver positively that the increased heat of the blood in the former instance caused the rapid movement of the heart, but it is certainly very probable that it was so. It is very intelligible that the heart would not obey the stimulus of the hotter blood, until it began to recover from its primary state of enfeeblement and depression. On this view, we can see in reaction one of those beautiful compensating efforts which are often exhibited by nature in disease. The very agent which weakens and depresses the chief organ of the circulation, sets up a condition in the blood which counteracts the original mischief, or at least greatly tends to do so. In some persons, severe fatigue is followed by very marked pyrexia. This may be well accounted for on the view proposed. The expenditure of nervous force leaves the sympathetic in a semi-paralysed state; hence comes increased heat of blood, and from this again results increased cardiac movement.

The character and degree of reaction (speaking of it for a moment generally) will vary very much according to the nature of the poisonous influence, and the vital endowments of the system. In fevers of a low type, the muscular tissue of the heart may become so impaired in its quality that it answers but languidly to the stimulus of the hot blood. In the ardent inflammatory fever of tropical countries, especially when it affects new comers, the highly irritable contractile fibre responds energetically to the stimulus. Bloodletting is well borne in the latter, is injurious in the former.

Authors mention the occurrence of paroxysms consisting of a cold or a hot stage only. In the former case, it may be considered that the poison has operated chiefly on the cerebro-spinal system; no febrile reaction takes place, because the temperature of the blood has not been increased by paralysis of the sympathetic. In the latter, the poison operates exclusively on the vaso-motor nerves, and therefore pyrexial phenomena alone are produced. That the poison should thus restrict its action in some cases to a certain department of the nervous system

cannot be considered improbable, when we think how decidedly this is the case in various neuralgiæ.

Virchow attributes the reactionary excitement of the heart to paralysis of the vagus nerve; but, though this might very possibly increase the rapidity of its action, it would not, I conceive, augment its energy, which is certainly the most important feature of reaction. Moreover, careful experiments on the effects of dividing the vagi (Reid's) do not show any very positive result in accelerating the heart's contractions.

In the third stage, the tissues regain their power generally, secretions are poured out by the glands which have hitherto been inactive, the abnormal heat diminishes as the sympathetic nerves recover their tone, and the action of the heart becomes tranquil gradually.

In the *algide* fevers, the prominent phenomena which we have to explain are the icy cold of the surface, the elevation of the temperature after death, the smallness or suppression of the pulse, the peculiar cerebral torpor, but without coma or loss of consciousness, and the debility and depression. The same results of hyperæmic afflux and congestion in the cranial and abdominal viscera are found as in the other forms of ague fever. The skin is not always pale, but sometimes of natural colour, sometimes livid, or covered with livid spots. One may read these cases as the results of a morbid influence, which operates more after an irritating than a paralysing manner. The brain is evidently greatly enfeebled, but rather, it would seem, in the same way as a sensory nerve, when it becomes numbed during an attack of neuralgia, a condition which Romberg denominates anæsthesia dolorosa. This cerebral numbing appears more like the result of a peculiar irritation, than simple loss of power. It is carried to a still greater degree in certain soporose fevers, where it produces absolute coma, which may be relieved by opium. A similar state prevails in the vaso-motor nerves of the limbs and surface; they are irritated and excited, instead of being paralysed, as during pyrexia. It is reasonable to suppose that the icy cold may, at least in part, be the result of this state; as it was found in Bernard's experiments that, when the upper end of the divided sympathetic was galvanised, the temperature fell below the normal figure. The elevation of the temperature after death seems necessarily to imply that some cause was acting during life to depress the heat that should have been normally developed. This cause is probably the irritated state of the vaso-motor nerves. The livid colour of the surface, like the leaden hue of cholera, is to be regarded, I believe, as the result of tissue paralysis; in consequence of which, and of arterial occlusion, stagnation occurs in the capillaries and small veins. A remarkable case recently fell under my notice, in which the nose and hands became cold and of a dull livid red on exposure to the open air, even in the middle of June. The other symptoms were extreme nerve-debility, tremors, and sweats.

It does not appear to me possible to account for such phenomena solely on the ground of arterial contraction. I may quote the follow-

ing observations from my note-book, in further illustration of this state :—"Frog's web, arteries of the part rather contracted, the blood in numerous capillaries stagnant, filling them up with an uniform red mass; the application of warmth dilates the arteries, and induces free flow in the capillaries." Wharton Jones records similar observations. This condition, which has some analogy to that existing in some algide fevers and in cholera, is widely different from that which is commonly observed as the result of cold operating upon a quite healthy part, which it renders exsanguine and pale. To quote again :—"The effect of warmth and cold upon the circulation is very striking; by cooling the web with cold water, some arteries are brought to be completely contracted and empty, and the transit of red and white globules through the capillaries ceases, so that they appear empty; but as soon as the web is dried and warmed, the artery is found expanded and transmitting a full current, and the capillaries at the same time become filled with red corpuscles." It seems clear that, in these instances the vital condition of the tissue alone makes all the difference, whether the capillaries are filled with corpuscles or not. If the tissue be quite healthy, the capillaries, during arterial occlusion by cold or other causes, will be traversed only by plasma, and will be empty, or nearly so; if the vital power of the tissue be weakened, the blood congests and fills up the capillaries, but does not adhere to their walls, and the congestion is dissipated by free flow; if the nutrition force be perverted, as in sthenic inflammation, creating local attraction of a morbid kind between the blood and tissue, then stasis occurs, which is not removed, but only aggravated, by dilatation of the arteries and free blood flow. The existence of arterial contraction, amounting sometimes to occlusion, would account for the smallness or obliteration of the pulse, supposing it to extend to the radial and arteries of the same size.

The state of the heart probably varies, being in some cases directly enfeebled, in others enchained or embarrassed in its acting by morbid stimulus. Its movement does not seem to be accelerated into reactionary excitement, or only partially, even during the decline of the paroxysm. This is to be accounted for, partly by the cerebro-spinal system being more affected than the sympathetic, partly by the depressing influence being too intense to be overcome by the somewhat heated blood. It seems reasonable to think that in cases of this kind, on the view that hyperirritation of the vaso-motor nerves was chiefly concerned in causing peculiar symptoms, the administration of opium with some diffusible stimulus would be beneficial.

In the *comatose* fevers the coma may result from the palsying or enchaining action of the malarious poison telling upon the cerebral hemispheres, in which case it will occur in the earlier period of the attack, and will be relieved by opium. Or it may proceed from increased flow of blood to the brain, and excessive congestion tending to effusion, when it will occur in the reaction period, and will be

relieved by blood-letting, local and general, cold to the head, and quinine.

In *syncopic* fevers (*terciera syncopal* of Pera), the heart is paralysed more or less completely by the malarious influence acting on its nerves, just as a voluntary muscle, or set of muscles, may be. The syncope occurs, as far as I am aware, at the commencement of the cold stage. It may be difficult to distinguish these cases from others approximating more to the algide group, in which there is complete suppression of the pulse ; but the heart, so far from being paralysed, is heard on auscultation acting violently, as if striving to overcome some obstacle, which is probably the occluded state of the arteries. The character of the impulse and sounds of the heart will generally enable us to make a diagnosis. The distinction is of great moment ; for in the first case stimulants would of course be necessary, in the second sedative measures.

Local palsies of any motor or sensory nerve, or local neuralgiæ or convulsions, may occur, the affected nerves being either irritated or enfeebled.

If *jaundice*, co-existing with free bile flow, or any other *secretion flux* occur, it indicates that the vaso-motor nerves of the part are palsied, whence comes dilatation of blood-vessels, hyperæmia, and over-activity of the gland tissue.

The formation of a *splenic tumour* results from excessive flow of blood to that part, and increased formation of splenic tissue, *i.e.*, increased nutrition. It is therefore quite analogous to a gland flux. Both occurrences illustrate well the development of increased activity in the affected tissue as the result of paralysis of its vaso-motor nerves.

The common occurrence of *dysentery*, either primarily from exposure to malaria, or a sequel or complication of malarious fever, is evidently a localisation of the morbid action, or it may be a concentration. The vaso-motor nerves of the large intestine are paralysed. and the usual results take place. It is to be mentioned, that the condition of a part, as to vital power, has much to do in determining the occurrence of inflammation after hyperæmia has been set up in the way supposed. If the vital power be tolerably sound, the part may remain unaltered, or may exhibit greater activity, as in the case of the gland flux ; but, if the vital power be depressed, severe inflammation may result, *e.g.*, purulent ophthalmia after section of the sympathetic in the neck. Though we can by no means see thoroughly into the matter, yet it does appear that there is a relation between the tissue power, the functional energy of a part, and its blood supply. In th healthy working of the apparatus, the former takes the initiative; and the hyperæmic afflux is subordinate, and ministers to the calls of the tissue in its increased nutrition. In inflammatory disorder, the vital power, which can use the blood for normal purposes, is depressed, and the hyperæmic afflux predominates, issuing in wasteful effusions of corpusculating fluids, mucus, or pus. Nay, it seems highly probable that in conditions of depressed vitality, as in frostbite, the scorbutic

dysentery of the Crimea and elsewhere, the existence of hyperæmia, even in moderate amount, acts as a morbid and destructive stimulus to the weakened part.

Having thus endeavoured to view some of the multifold manifestations of malarious disorder in the light of recent neuropathological research, it may be well to consider shortly what bearing those views have on other kinds of fever. It will be sufficient to take for examination two types, to one or other of which all approximate ; viz., first, the severe inflammatory fever of tropical countries ; second, the ordinary low fever, typhus, or typhoid, of our own. The phenomena of the first are, as described by Dr. Copland, slight chills only at the onset, subsequently "strong, full, hard, accelerated pulse," great heat, headache, and sometimes violent delirium, or maniacal excitement. Free venesection (to three or six pounds) is necessary. If in such fevers, on the above view, we admit the pyrexial condition to depend essentially on paralysis of the sympathetic, still it seems absolutely necessary to assume that the other tissues are in a state differing greatly from that which they manifest in many malarious, and all low fevers. The poison which has paralysed the sympathetic, has in no degree weakened the heart or the other organs. Hence the heated blood, acting on structures vigorous and prompt to respond to the stimulus, excites reactionary phenomena of great violence. It is the task of the physician to moderate these, as, if allowed to run their course unchecked, they induce a period of dangerous or fatal exhaustion.

How very apposite to this is all that we observe in the second type —the low fevers ! Here every part alike bears the stamp of depression and debility. The sympathetic system is palsied, and hence the febrile heat, and the proneness to hyperæmia in various parts. The heart is enfeebled, and often needs stimulus to keep its action from failing ; its very fibre often tends to soften and degenerate. The brain is enfeebled, and hence the low delirious wandering or the sopor. The voluntary muscles declare their atony by the down sunk posture of the patient.

The lesson of this seems to be, that while we incline, as we may reasonably do, towards the theory of the nerve origin of pyrexial phenomena, we must not lose sight of the fact that the other corporeal systems are also affected to a greater or less degree by the fever poison, and that the event of the disease may in great measure depend on the amount of vital resistance and energy which they retain. In malarious fevers the nervous system (cerebro-spinal and sympathetic) is certainly far more affected than the others. In low fevers all the systems alike seem to be paralysed and depressed. In sthenic fevers no system, except the sympathetic, seems to have suffered depression, but, perhaps, to be rather in a state of abnormal irritability. Thus one physician may choose for his motto, "He fed fevers ;" another, "He toned or soothed fevers ;" a third, "He bled fevers ;" each according to the kind he had most to deal with.—*British Medical Journal, Oct.* 10, 1857, *p.* 843.

2.—ON THE FORMS OF REMITTENT FEVER PREVALENT IN THE METROPOLIS.

By Dr. Thomas B. Peacock, Assistant Physician to St. Thomas's Hospital, and Physician to the City of London Hospital for Diseases of the Chest.

As to the diagnosis of this affection, 1. typhus fever is often distinctly traceable to contagion, or may be inferred to have so originated. It usually commences with symptoms which are sufficiently characteristic, but not very severe. An eruption makes its appearance on the skin from the fourth to the seventh day, follows a tolerably regular course, and disappears from the twelfth to the twentieth day. The fever advances with the progress of the eruption, relaxes as it fades, and convalescence usually follows its disappearance in a few days. The predominant symptoms throughout the course of the disease are those of prostration of power, and oppression of the nervous system, and the condition of the patient does not very materially change from day to day, or at different periods of the day. When death ensues, it is usually the result of exhaustion, or of inflammation of the cerebral or pulmonary organs; and where convalescence occurs, it advances very gradually, and the attack is not liable to be prolonged by relapses.

In all these respects typhus fever differs from remittent:—the accession of remittent fever is usually more violent, and the progress more rapid. There is no eruption on the skin, except towards the later periods, when purpurous spots may occur, or after the exacerbations, when miliary eruptions or sudamina occasionally appear. Except during the exacerbations and for a short period, the skin is not dry, the tongue not dry and brown, the pulse is not very quick, and the mind remains clear. The prostration of strength is less persistent, and there is little tendency to sloughing or excoriation of the dependent parts. There are marked changes in the condition of the patient at different periods of the day, or on different days, and a peculiar aspect very different from that of a patient labouring under typhus. There is greater tendency to hemorrhages from the mucous membrane, rheumatic symptoms, vomiting, jaundice, and diarrhœa; and lastly, while the relaxation of the fever ensues rapidly, and apparent recovery takes place at an early period, there are often one or more relapses, by which the duration of the attack is prolonged.

2. From typhoid the distinction of the remittent fevers is, at first sight, less obvious. The two diseases bear, indeed, considerable resemblance in the tendency to hemorrhage from the mucous membranes, in the frequency of diarrhœa and jaundice, and in the occurrence of relapses with profuse perspirations; but, when more closely viewed, they present very distinctive features.

The mode of accession in typhoid is generally gradual, the patients being usually indisposed for some time before the appearance of seri-

ous symptoms; diarrhœa is generally present in a more or less marked degree from an early period, and continues throughout the attacks; the tongue is usually dryish, or dry, with a brown coating above, and morbidly red towards the tip and edges; the pulse is quick; there is much torpor and oppression of mind, and gradually advancing and long-continued prostration of strength. An eruption of a peculiar form is usually observed on the skin at some period of the disease. The patient does not present marked changes at different times of the day or on different days. The attack is often very prolonged, and convalescence is very gradual. Remittent fever, on the contrary, attacks suddenly, is rapid in its progress, displays frequent exacerbations and remissions; and is unattended by any eruption on the skin. The eruption in typhoid is less constant than in typhus; it yet appears in a sufficiently large proportion of cases to make it of diagnostic value. Thus, it was present in all but 16 out of 66 cases under my own care, the notes of which I have analysed. Its entire absence, therefore, in remittent fever is a marked distinction between the two affections. Sudamina are, probably, about equally common in the two forms of fever. I have noticed them as having appeared in 22 out of 52 cases of typhoid, and in 4 out of 9 cases of remittent fever. These states possess, however, in neither affection any material diagnostic importance. They are found in other forms of febrile disease, in which, after a dry state of the skin, there is a tendency to perspiration; they are more common in hot weather, and when the patient is too warmly clad and covered, than under other circumstances; and they appear to depend upon the obstruction of the ducts of the sudoriporous glands by dry cuticle. The ordinary purpurous spots, which are comparatively rare in typhoid, are not uncommon in remittent fever.

In the frequency of relapses typhoid and remittent fevers are closely assimilated, while both differ in the same respect from typhus. Taking a series of years together, I find that relapses of greater or less severity are reported to have occurred in 1 in every 6 of the severe cases of typhoid, or in 6 out of 35 cases which I have treated at St. Thomas's during the last three or four years. Their frequency varies greatly at different periods and seasons. Thus, they are most frequent during the early autumn, and they were especially common in that season of the year 1855; they also will probably be found to vary in frequency in different localities. The tendency to relapse in typhoid is, however, I conceive, an accidental complication, dependent, amongst other causes, on the influence of malaria to which the patients may have been exposed, as well as to the poison of typhoid; in the same way as rheumatic or neuralgic affections may assume an intermittent or remittent character from the same cause, or as cholera may supervene during the progress of typhoid. In remittent fever, on the contrary, the exacerbations and remissions are essential features of the disease. It is noticed by Dr. Grant, as a distinction between the continued fevers having a more or less remittent type and the remitting fevers,

that the remissions in the former take place about eight o'clock in the morning, and continue till about three in the afternoon; whereas, in the true remitting fevers, the remissions and exacerbations occur at irregular periods, and sometimes twice or oftener during the day. The aspect of a patient labouring under typhoid is also different from that of a person suffering from remittent fever, though this distinction is less marked than between both these forms of fever and typhus.

3. Remittent fever and relaxing fever are still more closely assimilated. Were I, indeed, to form an opinion, from the few cases of relapsing fever which I have seen in London, I should certainly doubt their specific distinctness. The two diseases so closely correspond, that in looking over reports of cases treated some time ago, it becomes extremely difficult to decide to which form they are to be assigned. In the epidemic of relapsing fever, as it prevailed when I saw it in Scotland in 1843, and as it has been described by various observers, the disease seemed, however, to depend upon a specific cause, different from those to which typhus, typhoid, or the ordinary remittent and intermittent fevers owe their origin. Thus, it frequently attacked various members of families in succession, and it infected the medical attendants, nurses, and other officers in the hospitals. It also prevailed epidemically in districts remarkably free from malarious influence. Thus Edinburgh occupies a situation peculiarly free from the sources of malaria. The surface is rocky, consisting of limestone, sandstone, and trap; the soil is shallow; the site is freely exposed to various winds, especially to those blowing from the sea; the fall of rain is small, and there is but little foliage. We also find that remittent and intermittent fevers are at the present time almost unknown there. Thus from the statistical report of the cases treated at the Royal Infirmary from October 1841 to same date of the following year, it appears that only two cases of ague occurred out of a total of 3530 cases treated, and both of them, if my memory does not deceive me, were in strangers. In the remainder of 1842 and the first six months of 1843, three patients were treated for ague out of 2840 cases, and of these one only resided in Edinburgh or Leith. Thus of 6370 patients, five only had ague, and probably only one of these contracted the disease in or near Edinburgh. During the succeeding 15 months, which embraced the period of prevalence of relapsing fever, three cases of ague only were treated out of 7204 cases. So that Edinburgh, though the relapsing fever there assumed its most characteristic form and prevailed most extensively, is a situation in which it would have been the least likely to appear did the disease depend only on a modification of the ordinary causes of intermittent and remittent fevers. We may therefore infer that the two forms of fever are specifically distinct. The cases of relapsing fever bear, however, a very close resemblance to some of the forms of remittent fever, and it is not easy to point out their distinguishing features. Both are characterized by their sudden accession, short course, rapid convalescence, and tendency to relapse

and to be complicated with rheumatism, jaundice, and hemorrhages. The primary attack of relapsing fever is, however, of a more continuous character, and does not present the frequent exacerbations and remissions which occur in remittent; and the relapses occur at more distant intervals, are of longer duration and less frequent. There is also a very close resemblance between the short febrile attacks to which the terms ephemera, febricula, and diary fever have been given by systematic writers, and short paroxysms of intermittent or remittent fever. The cases of febricula do not, however, appear to possess any specific character, but rather consist of imperfectly developed attacks of other forms of fever, and they probably not unfrequently owe their origin to the influence of malaria.

The *treatment* pursued in this form of disease varied with the peculiar character of the individual cases. If the patients, when they first came under treatment, presented symptoms of active febrile disturbance, febrifuge medicines were prescribed—nitrate of potash, the acetate of ammonia, &c., with, in some instances small doses of the potassio-tartrite of antimony. In some cases perspiration was encouraged by packing the patient in a blanket wrung out of hot water. As the active symptoms gave place to depression of strength, or where the active febrile stage had subsided before the patient was seen, the chlorate of of potash, generally with the muriatic acid, was given; and when the prostration was still greater, bark, ammonia, wine, brandy, &c., were exhibited. When the periodic character of the disease became more apparent, quinine and bark were had recourse to in fuller doses; and when the natnre of the disease was from the first apparent, these remedies were immediately employed. When there were evidences of active cerebral disease, or of pneumonia, or bronchitis, leeches, cupping, or counter irritants, and, in the latter cases, antimony, were used. The hepatic symptoms were treated by hydrarg. c. cretâ or calomel in combination with opium or Dover's powder; the rheumatic pains, &c., by colchicum. Diarrhœa, dysentery, discharges of blood from the mucous membrane, and profuse sweating, were arrested by the employment of astringents—gallic, tannin, or sulphuric acids, acetate of lead, &c., with opium. Anodynes, opium, and morphia were exhibited to calm delirum and procure rest.

As a general rule, depletion or any depressing means was very ill borne, and, if pursued at the outset of the attacks, liberal support and stimulants were soon very freely required. The remedy upon which we chiefly rely in relieving all diseases of a periodic character—bark and its alkaloid quinine—were employed, to a greater or less extent, in all the cases. The quinine was generally given in conjunction with the decoction or tincture of bark, or both, and in doses varying from 2 to 6 grains, repeated three or four times a-day. In the mild and uncomplicated cases this treatment was generally soon successful, the paroxysms becoming slighter, and occurring less frequently, but in other instances the treatment was less efficacious.

In one case the quinine failed entirely to prevent or to defer the occurrence of the relapses. or to lessen their severity, though the patient had at one period taken it for six days continuously, and for the last two days to the extent of 12 grains daily, together with a considerable quantity of tincture of bark, and was then fully under the influence of the drug, as indicated by the peculiar nervous symptoms.

At another period of his illness, the same patient took 8, 6, and 15 grains of quinine, together with tincture and decoction of bark on three successive days, without any satisfactory results,—a paroxysm of great severity occurring on the third day. Subsequently the attacks were both deferred and rendered less severe by the use of smaller doses, very frequently repeated. The case ultimately, however, proved fatal. I have not tried in any of the cases of remittent fever which I have treated, the use of the larger and frequently repeated doses of quinine, as recommended by Dr. Dundas. This treatment has been found useful in the endemic remittent fevers of hot climates, and would probably be beneficial in those which occur in this country; but, from the depression which is apt to follow the use of quinine in such doses. and the unpleasant nervous symptoms which it occasionally excites, its employment would require great care. In the case to which I have above referred, the use of quinine was certainly carried to the fullest extent compatible with safety, yet it failed to accomplish the desired effect. In the simple cases of remittent fever, moderate doses of quinine are sufficient; and in the severer and more complicated cases, the excessive depression of strength which follows the occurrence of the exacerbations and relapses, the great irritability of the stomach which oftens attends them, and the shortness of the interval, make it very difficult to get the required remedies taken, and would render great caution necessary in the use of large doses of quinine.—*Med. Times and Gazette, May* 9, 1857, *p.* 455.

3.—ON HÆMATURIA AFTER SCARLET FEVER.

By Dr. William R. Basham, Physician to the Westminster Hospital.

[In those cases where we have convulsions, coma, and death, there is no hesitation in attributing the symptoms to uræmic poisoning, any more than if the mischief were limited to renal disturbance. The congestion of the kidneys, the hematuria, which form the incipient stage of the disorder leading to this uræmia, arise undeniably from the imperfect elimination of the original virus.]

If I may sum up in a few words the broad fundamental, therapeutical principle in such cases, I would say, we must endeavour to bring into activity and act upon those functions and emunctories which are not, or only in a moderate degree, implicated in the morbid disturbance, and by their agency relieve, if possible, the oppressed and im-

peded organs. Thus, though the surface of the body is anasarcous, we must endeavour to promote its exhaling power; and as the intestinal mucous surface gives no indication of sharing in the morbid state of the kidneys, we must bring its secretions into activity to purge the system of the accumulated fluid, and vicariously, for a time, relieve the kidneys of their office. The intimate sympathy between the kidneys and skin, and between the latter and the bronchial mucous membrane, when the latter is the seat of inflammation, would entitle us to expect the most beneficial results by vigorously promoting the cutaneous function; but unhappily, in these cases, the dropsical state of the surface of the skin precludes our obtaining much efficient aid in this direction. Warm baths effect oftentimes great temporary relief to the lungs; the breathing becomes less oppressed, and the secretion from the bronchial tubes more free; but the hot-air bath appears to be the most efficacious; there is not that exhaustion which is induced by a succession of warm baths, and, to my observation, the amount of relief felt by the patient is greater. To aid these external appliances, ammoniacal salines may be given internally with advantage. Active purging, however, yields the best results. It is, however, of importance to select appropriate means to obtain the greatest amount of relief, for it is not every purgative of the Pharmacopœia which answers this purpose equally well. That purgative which acts most directly as a hydrogogue is the best adapted, but which, at the same time, is not followed by any disproportioned exhaustion, or by any torpid reaction. The combination of jalap and cream-of-tartar is most admirably suited to these ends. It acts quickly, without depressing the system, is not followed by inactivity, and induces copious watery dejections. The patient was much benefited by these purgative remedies; the febrile state was lessened, the tongue became moist, and doubtless, from the amount of fluid drawn away by the cathartic, may be explained the great increase in the specific gravity of the urine. There was manifest abatement of the dropsical condition, and the breathing was easier and expectoration more copious. Continuing this plan of treatment, the improvement became sufficiently pronounced to justify the administration of chalybeates. At the same time, the state of the urine, revealed by the microscope, together with the appearance of that peculiar pigmentary condition observed in combination with the albumem, suggested a very unfavourable prognosis, although I was not without hope that the renal degeneration had not reached that stage at which ultimate, though remote, recovery might be possible. The casts of the tubes were partly transparent, partly granular. The few epithelial corpuscles visible within the tubes were filled with fat granules, and the tubes contained many scattered fat granules; highly refractive, and completely removed by ether. These microscopic conditions indicate an advancing stage of degeneration, and if spread through both kidneys, must be quickly followed by an imperfect elimination of the chief urinary constituents; and this was evident by the singularly

watery state of the urine, its specific gravity not exceeding 1·005, but containing abundance of albumen, and this latter, associated with a peculiar pigmentary matter, rendered visible after boiling by the addition of nitric acid.

It would be out of place here to enter into an investigation of the nature of the pigments that are occasionally met with in the urine, cyanurin, melanurin, &c. Experience tells me that the development of this pigmentary condition, in combination with albumen in the urine, is of the gravest import. It is always associated with the most advanced stage of renal degeneration, and in every instance in which I have seen it, it has been quickly followed by fatal results. Lehman, in his "Physiological Chemistry," (vol. ii., p. 428,) says, as far as his experience goes, it is only when uræmic symptoms have manifested themselves, that this peculiarity of the urine is generally observable, and this entirely coincides with my own. We should not then be unprepared for the development of unfavourable symptoms whenever this peculiarity of the urine is observed; so that notwithstanding the apparent improvement in the child's condition, even to the diminution of the dropsy of the surface, I expressed my fears at the time that this hopeful state would be but temporary. And surely nothing can exhibit the value and importance of frequent examination of the urine in such cases more forcibly than the fact here obtained, and the unfavourable inference deduced. In all other respects there was an apparent amendment, and if we had based the prognosis only on the general aspect of the patient, we might fairly have inferred that all was going on well. It is not of less importance in hospital practice than in private, nor is it less necessary amongst the poor than amongst the rich, to be explicit and candid in the expression of our fears or hopes to those anxiously interested in the welfare of the patient. It is as much the office of the physician to allay anxiety where that can be done with prudence, as it is his more distressing, but not less imperative duty to disclose his worst apprehensions, especially when he sees expectations of amendment cherished, which experience teaches him will be but temporary, and which must soon give way to less equivocal signs of approaching danger.

In the present instance, I believe the warning given to the mother was unheeded, the amendment was so palpable to her, that she would not believe but that our unfavourable opinion was mere conjecture. You may learn an important point here—namely, the suddenness and and abruptness with which the symptoms of uræmic poisoning oftentimes commence. In some cases, particularly in adults, the indications are progressive; but here all other things being promising, convulsions suddenly supervene; they intermit, but coma characterizes their remission, and the patient dies forty hours after the first indication of the urinous poison acting on the nervous centre. You may very properly ask,—Can nothing be done in this crisis?—Are there no remedies available for such a state? These cases of convul-

sion are not always fatal; sometimes in the intervals consciousness returns. Such cases offer a better prospect for remedial agents than where the patient remains comatose. In either state, however, an effort should be made to excite the bowels to active excretion. Enemata containing, according to the age of the patient, half a drop, or a drop, of croton oil, should be administered, and where the ability to swallow is unimpaired, you may expect some benefit from the chlorine mixture, the agency of which, according to the hypothesis of Frerichs depends on its union with the carbonate of ammonia, into which the urea in the blood is converted, and which he considers to be the poisonous agent in these cases of fatal uræmia. I have in vain sought for proofs of this doctrine, but whether the hypothesis be true or false, clinical experience tells me that much benefit is often derived from chlorine administered in the form constantly employed by me.—*Lancet, June* 20, 1857, *p.* 623.

4.—*Nitro-Muriatic Acid in the Gastric Fever of Children.*—A remedy, which is a favourite one with Dr. Arthur Farre, in his out-patients' room at King's College Hospital, in the treatment of gastric fever in young children, is the nitro-muriatic acid. To a child of a year and a half to four years old, a mixture containing a drachm each of the diluted nitric and hydrochloric acids, to six ounces of water, is ordered, in doses of half an ounce, three times daily. At the same time a dose of grey powder (four grains) is given every night at bed-time. If the disease be passing off, and tonics needed, the grey powder may be omitted, and the acids given in infusion of quassia, or with bark. The peculiar tongue of infantile gastric fever is well known, resembling closely that of scarlet fever in the prominence of its papillæ, but differing from it in having a white, instead of a red ground. Thus the papillæ present in the midst of a whitish fur; but in some cases the centre of the tongue is red and beef-like, the sides only being furred.—*Medical Times and Gazette, May* 16, 1857, *p.* 489.

5.—ON ACUTE RHEUMATISM.

By Dr. W. S. Oke, Senior Physician of the Royal South Hants Infirmary.

That acute rheumatism is a true inflammatory disease cannot reasonably be doubted. The character of the pulse and of the tongue; the condition of the urine, loaded with lithates and purpurates; and the appearance of the blood drawn from the system, all go to prove that it is so; and, if further proof were necessary, it is to be found in the fibrinous and sometimes suppurative results of the rheumatic action. The former is clearly shown in the pericarditis; the latter in

abscesses occasionally formed near the affected joints, some cases of which I have myself seen in the Royal South Hants Infirmary.

Acute rheumatism, when confined to the joints, generally terminates in recovery; but, when it attacks the heart or any other internal organs, the prognosis is unfavourable.

The diagnosis is by no means difficult; its febrile and inflammatory character will distinguish it from neuralgia and syphilitic periostitis. The selection of the larger joints; the profuse perspirations; the deep bilious tinge of the urine, in addition to the lithates; the greater degree of pyrexia; and the comparative failure of colchicum to relieve the pain and speedily terminate the attack,—will suffice to distinguish it from gout. In the treatment of this malady, and indeed of all others, the curative efforts of the constitution are to be kept constantly in view; and two of a very decided character may be generally observed in acute rheumatism. The one is to evacuate by the kidneys a large quantity of bile and of lithic compounds; the other is to eliminate profuse perspirations from the whole surface of the body. It has been supposed by some that, as the excessive sweats do not appear to afford any relief, but rather to exhaust the powers of the constitution, they ought to be restrained. This is an opinion which I cannot endorse, as it is contrary to common sense, and even dangerous to life; for, in all probability, acute rheumatism would prove fatal in a large majority of cases but for this timely outlet from the skin.

The indications of cure in acute rheumatism are to subdue the febrile inflammatory action, and to correct the condition of the blood: and these indications will be fulfilled by blood-letting, by such means as will keep free the renal, hepatic, and cutaneous outlets, and at the same time allay the sufferings of the patient.

There is, perhaps, no disease which has been, and continues to be, treated with so many different remedies as acute rheumatism. These, for the most part, I shall pass by, as the main object of this paper is to give the result of my own experience, rather than that of others; and I believe myself to be justified in saying that this disease, when treated from the beginning and under favourable circumstances, may be speedily cured by the direct efficacy of medicine.

At the onset, unless there be any valid reason to the contrary, it will be right to take from the system from twelve to fifteen ounces of blood, the clot of which, after standing a while, will be found remarkably firm, with a buff-coloured concave surface of tough coagulated fibrine. But this appearance will not justify a repetition of the bleeding unless any symptoms shall arise that may require it. Half an ounce or more of castor oil is then to be given, which may be repeated every other morning, or from time to time so long as the urine exhibits a bilious character. Immediately after the purgative has ceased to operate, the following medicine is to be commenced:—

℞. Hydrargyri chloridi, aloes extracti aquosi, aa gr. vj ; pulveris opii, extracti colchici acetosi, antimonii potassio-tartrat. aa gr. iij ; confectionis rosæ q. s. M. Divide massam in pilulas duodecim, quarum sumatur una 4ta quaque hora, cum haustu infra prescripto.

℞. Potassæ bicarbonatis ℈j ; acidi citrici gr. xv ; liquoris potassæ ℥x ; potassæ nitratis gr. x ; syrupi ℥j ; aquæ puræ ℥iss. M. Fiat haustus.

In about twenty-four hours, or less, the pains will be relieved. In five or six days the joints will be set at liberty, and in twelve or fourteen the swellings will have subsided, and the febrile symptoms be subdued. Then, if the tongue be clear and the pulse below 70 in the minute, an alterative alkaline tonic may be given, to strengthen the general health, and prevent a return of the disease.

℞. Potassii iodidi gr. xxiv ; liquoris potassæ ℥iss ; ammoniæ sesquicarbon. ℈j ; syrupi zingiberis ℥ss ; aquæ menthæ piper ℥vj. Fiat mistura, cujus sumatur ℥j ter die.

At the same time, it will be necessary to continue a gentle aperient twice or thrice a week.

℞. Pilulæ hydrargyri gr. xij ; ammonii potassio-tartratis gr. iss ; extracti aloes aquosi gr. xx. Misce bene, et divide in pilulas vj, quarum capiat unam pro dosi.

This is the treatment which I have almost always adopted for acute rheumatism, in the Royal South Hants Infirmary and elsewhere ; and, with very few exceptions, it has been crowned with complete success.

If, either from advanced age, a morbid condition of the gums, or any other cause, the use of mercury should be deemed inadmissible, one of the following medicines may be substituted :—

℞. Antimonii potassio-tartratis, extracti colchici acetici, pulveris opii, pulveris digitalis, aa gr. iij ; extracti aloes aquosi gr. xij ; syrupi q. s., ad massam formandam. Divide in pilulas xij, quarum capiat unam 4ta quaque hora.

Or the following :—

℞. Vini colchici ℥ss ; potassæ bicarbonatis ℥iss ; potassæ nitratis ℥j ; syrupi zingiberis ℥iij ; misturæ camphoræ ℥vj. Misce. Capiat æger cochlearia magna duo ter die, et, dolore artuum urgente, cum hac pilula.

℞. Pulveris ipecacuanhæ compositi gr. v ; syrupi q. s. M. Fiat pilula.

Sumatur etiam olei ricini ℥ss, secundo vel tertio quoque mane.

These means will be found adequate to relieve the pains of the joints, and sometimes speedily subdue the disease ; but these are not, in my judgment, so well calculated to protect the internal organs from rheumatic inflammation as the former treatment combined with calomel.

From the very onset of acute rheumatism, more especially in young

persons, the action of the heart is to be daily watched by auscultation. Indeed, it may be truly asserted that, in this case, the stethoscope is as needful to the medical man as the lead is to the mariner; for, as soon as any abnormal sound of the heart's action is detected—nay, if there be pain only of the cardiac region, accompanied by *fast breathing* and *acceleration* of the pulse—he is warned of approaching danger, and imperatively called upon to advance in the scale of treatment. Blood should be taken from the arm, leeches and blisters applied to the seat of pain, and the system brought under mercurial action as speedily as possible.

℞. Pilulæ hydrargyri gr. xxxvj; antimonii potassio-tartratis gr. iss; extracti digitalis, pulv. opii, aa gr. i. Misce bene, et divide in pilulas vj, quarum capiat unam 4ta quaque hora.

The protoxide of mercury is preferred to calomel, as being more speedy in affecting the system.

Should the gums become soon ptyalised, the fibrinous textures of the heart and pericardium will probably be rescued from the attack; but if the mercury fail to affect the system, and a bellows-sound remain after the arthritic symptoms have subsided, the fibrinous vegetations upon the valves will probably have become organised, and more or less interrupt the free current of blood through the valvular apparatus for years afterwards. Or, on the other hand, if the rubbing sound, which had been detected close under the parietes of the cardiac region, should cease, leaving a laborious action of the heart, a rapid and irregular pulse and embarrassed breathing upon the least exertion, an adherent pericardium may be diagnosed, beyond the reach of human skill; and a sudden termination of life prognosticated.—*British Medical Journal, May* 23, 1857, *p.* 428.

6.—*Acute Rheumatic Fever.*—The idea that acute rheumatic fever arose from the presence of lactic acid in superabundance in the system, and that the symptoms could be accounted for from this cause, was first propounded by Dr. Prout. Since, Dr. Todd, Dr. Fuller, Mr. Spencer Wells, and other writers have supported this view. Dr. Richardson has just made some very important experiments to try whether it admitted of any direct demonstration. On July 8th, he injected into the peritoneum of a healthy cat 7 drachms of a solution of lactic acid, with 2 ounces of distilled water. The operation was performed without accident. The opening in the peritoneum was made valvular, only sufficiently large to introduce a small injecting tube. Two hours after the operation the action of the heart became irregular. The animal was left for the night about six hours after the operation, and in the morning was found dead. The inspection showed no peritoneal mischief, but the most marked endocarditis of the left cavities of the heart. The mitral, thickened and inflamed, was coated on its free borders with firm fibrinous deposit. The whole endocardial

surface of the ventricle was intensely vascular. On Monday last, Dr. Richardson repeated this experiment on a healthy dog. On the 14th the dog was living, and was seen and examined by Dr. Snow, Dr. Rogers, Mr. Spencer Wells, Dr. Webb, Dr. G. Hewitt, Dr. Snow Beck, and others, and the experiment of injection was repeated on a second dog. The first dog died on Wednesday, and the inspection revealed the most striking pathological signs of endocarditis. The tricuspid valve was inflamed and swollen to twice its ordinary size. The aortic valve, swollen and inflamed, was coated on its free border with fibrinous beads. The endocardial surface was generally red from vascularity. The pericardium was dry and injected. As before, the peritoneum escaped injury. The joints were not affected, but there was distinct sclerotitis in the left eye. The other dog remains under observation. These experiments demonstrate that endocarditis may be physiologically produced by lactic acid. Dr. Richardson has a further list of experiments on hand, in which he carries on the inquiry as to the influence of the acetic, the citric, and the uric acids, when introduced into the system in a similar manner.—*Med. Times and Gazette, July* 18, 1857, *p.* 68.

7.—*Treatment of Acute Rheumatism.*—We believe we may safely write it, that the opinions of London Physicians are rapidly coming into general concurrence in the rule, that the treatment of acute rheumatism should be by one or other of the salts of potash. Dr. Barlow remarked the other day to his class that he had lately been trying the bicarbonate, so strongly recommended by Dr. Fuller, but that he found it, as a rule, less efficient than the acetate, his former favourite. He felt no doubt, however, that both were useful. Especially in the most acute class did he prefer the acetate and nitrate to the bicarbonate. Very probably there may be varieties of the rheumatic diathesis, in which one or the other salt is more useful than its congener, the base, potash, being the ingredient essential to all. A combination which we have ourselves got into the habit of prescribing, is of the nitrate eight grains, of the bitartrate fifteen grains, and of the acetate a scruple, given well diluted, in a single dose every four hours.—*Med. Times and Gazette, Aug.* 29, 1857, *p.* 220.

8.—ON THE VALUE OF LEMON-JUICE AND ACETATE OF POTASH, IN THE TREATMENT OF ACUTE RHEUMATISM AND GOUT.

By Dr. William Moore, M.R.I.A., Lecturer on Materia Medica in the Dublin School of Medicine.

[In all cases of acute rheumatism where we conclude that the portal system is congested, the following treatment should be adopted.]

Exhibit a brisk mercurial alterative and purgative, blue pill, or

calomel, with compound rhubarb pill, and dried soda. This treatment may be indicated at intervals during the course of the disease, more particularly during an attack of acute gout. When the bowels have been freely acted on, I prescribe the lemon-juice, in the proportion of a tea-spoonful or dessert spoonful, according to the age and calibre of the patient, every second hour, for the first forty-eight hours, and if its sedative effects manifest themselves so early, I continue the same treatment; should there be no change observable, I increase the dose in the case of an adult, to half an ounce every third hour, with lemonade *ad libitum*. In cases where this plan of treatment seems to act specifically, amongst its other good qualities it tends to keep the bowels, as well as the other emunctories, free, and thereby lessens a source of annoyance both to the patient and practitioner, which other forms of treatment tend rather to aggravate. Occasionally we meet with cases in which the sedative effects of lemon-juice are well exemplified during the night also, but as a rule, I should be inclined to give from fifteen to thirty minims, according to the age of the patient, of the solution of muriate of morphia, same strength as laudanum, at bedtime.

The acetate of potash is deserving of great attention in the treatment of acute rheumatism, either *per se* or combined with lemon-juice; largely diluted it is a decided diuretic and laxative. I have prescribed it in many cases of rheumatism, generally in combination with lemon-juice, and with good effect. Dr. Sandwith, of the Hull Infirmary, recently treated ten cases of rheumatic fever with acetate of potash, and with unusual success. He thinks its superiority consists in the rapidity of its action as a febrifuge, which is probably owing to its power in carrying off from the blood the specific poison which has excited the febrile commotion. He premised a suitable cholagogue of calomel, followed by a rhubarb or senna draught, when he suspected portal congestion, as shewn by arrest of the biliary and urinary secretions; after this he employed acetate potash ʒi. to ʒii., dissolved in half a pint of water, with the addition of a little lemon-juice and syrup, to be drunk during the day. Under this plan of treatment, three cases were cured in seven days, one in ten days, one in thirteen days, one in fourteen days, one in fifteen days, two in seventeen days, one in twenty days. He goes on to state that in the above cases there was no endocarditis, so that we may hope that a further trial of this remedy will show its power in resisting this fearful complication. Dr. S. employed the acetate of potash in chronic rheumatism, with marked advantage. I recently read, with great satisfaction, Dr. Garrod's cases, treated with bicarb. potassæ, in doses of ℈i. to ℥i., every second or third hour; but I regret to say I have not had an opportunity of trying this treatment; at the same time I have been assured that it has not proved equally successful in the hands of some of our most eminent physicians here.

As regards the local treatment in these cases, leeches to the inflamed part are seldom required; I prefer the more soothing applications, as

raw cotton, or anodyne fomentations. In gout, spirit of wine has been much lauded, as also alkaline poultices; but I think, in the majority of cases, the application of a weak tepid solution of spirit and water (1 part to 4) will be most grateful to our patients.—*Dublin Hospital Gazette, July* 1, 1857, *p.* 196.

9.—*Gutta Percha Paper in Rheumatism and Gout.*—Dr. Wetzler, of Aix-la-Chapelle, has given this erroneous name to a substance sold in Paris as "tissu électro-végétal," and which he finds to be nothing but plates of gutta percha as thin as paper. These, applied to parts suffering from chronic rheumatism or gout, have in his hands been found exceedingly beneficial, inducing great local transpiration. They are so thin as to cause no inconvenience, beyond their fragility, when applied over joints that are moved. He has also employed them early in cases of gonorrhœal rheumatism. Slight irritation of the skin is sometimes induced, but this is temporary.—*Froriep's Notizen.* —*Med. Times and Gazette, May* 16, 1857, *p.* 493.

10.—ON THE CONSTITUTIONAL TREATMENT OF CANCER.

By F. A. Bulley, Esq. (Reported by Dr. Mc Intyre.)

Mr. Bulley, in a paper read to the Pathological Society of Reading, commenced by stating that he considered the cachectic diathesis—which invariably accompanies the formation of cancerous disease, and which, according to some eminent authorities equally invariably precedes its external manifestation—to depend upon a peculiar broken down condition of the blood-corpuscles, by which they are rendered, through a disturbed nutrition of parts, capable of passing out of the limits of the circulation through the efferent nutrient vessels not naturally destined for their passage, and that they thus formed the morbid products characteristic of scirrhus; that thus having passed out of the limits of the circulation, the particles so deposited became decolorated, and, being out of the reach of the absorbent system, could not be removed by any means, except by caustic and the knife; that it was of no use to attempt a cure of the disease by either of these means, unless at the same time treatment was adopted to alter the condition of the broken down diffluent blood by restoring its globularity and firmness; by which only, according to the theory he maintains, the continuance or reproduction of the disease could be prevented. He stated, that he had made numerous microscopical observations of the blood of cancerous patients, and had invariably found the changes described. He had also observed microscopically the effects of recent vegetable infusions in restoring the globularity and firmness of the blood; observing daily the changes produced by their use in improving the local disease, as evidenced by the production of healthy granulations on heretofore unhealthy ulcerating cancerous surfaces. He

stated also, that the use of such remedies was not new, but that heretofore they had been given with uncertain purpose; and that he had no doubt that the beneficial effects (which he says are undoubted) of cicuta, the galium aparine, and a variety of other remedies of that class, owed their power to the influence they exerted in thus altering the condition of the blood. He stated that the dyscratic condition of the blood was in some measure owing to the interrupted respiratory functions of the skin occasioning a defective oxygenisation of the blood, the lungs being alone insufficient for that purpose; that this was seen in most of the cases of cancer he had witnessed; but most so in chimney-sweepers' cancer, where the excretory orifices were invariably found to be blocked up by little particles of highly carbonised soot; in other cases, the material blocking up the orifices being the dried natural secretions. He proposed to remedy this condition by the use of regular and methodical frictions, and ablutions. He mentioned a caustic application which he had frequently used successfully for the destruction of small morbid growths, viz., savine powder, and the anhydrous sulphate of zinc, to which he would now add a little chloroform, or a small quantity of morphine. He thus stated, as suggested by Dr. Simpson of Edinburgh, that he considered a scirrhous formation to be an actual hemorrhage and endeavoured to found upon such hypothesis a pathological distinction betwixt malignant and non-malignant growths; that in the former case the blood had passed out of the vessels: in the latter, they were simply impacted by some of the elements of the blood; thus in scrofulous tumours by its white particles, which were usually in excess in such cases; in fibrous deposits by its fibrous elements; the same of fatty tumours, &c.; and that each and all of these latter were capable of removal through the influence of stimulating local applications, and the effects of pressure or improved heart's action,—none of which were or could be beneficial in cancerous cases, because the blood had passed out of the circulatory channels. He drew a comparison betwixt the action of the knife and caustics in the removal for a time of cancerous disease, each acting by causing the vessels on the proximal side of the disease to be plugged up until new vessels, through which the dyscratic element could be poured, had again been formed, and thereby showed the uselessness of local treatment, unless the existing dyscrasia could be removed. He stated, that it was difficult to say from what this dyscrasia originated, but he believed it to be from a deficiency of albumen in the blood; and this might arise from deficiency of food, defective formation, or waste through the secreting organs—as the kidney. This last he has often found, and believes it to be one of the most frequent causes of the pre-existent and concomitant cachexia that, he says, invariably attends upon cancerous formations. In conclusion, he stated, that all authors agree that vegetable substances increase the albumen of the blood; in other words, according to Mr. Bulley's views, its globularity and firmness; and thus prevent its escape from the vessels in the shape of cancerous tumours; and when these have

already formed, that such remedies are capable of suspending the action of the disease, and where they have done so, that operations, either by the knife or caustics, may be performed with the fairest chance of success, provided the vegetable remedies are continued for some time after the apparent cure of the disease.

Perhaps no subject connected with our branch of science has engaged greater attention of late years than that of cancer; and if any proof, more substantial than another, were needed, that we in reality know nothing of the matter, it would, I think, readily be found in the discrepancy of opinion that exists both as to its nature, its mode of origin, and its treatment. The cell theory of Müller seems now by many to be discarded; whilst by others it is retained in its pristine favour; and so far as I can find, no satisfactory solution of the difficulties that surround the subject has in any measure been obtained. The views Mr. Bulley has propounded will not, I fear, share better than their predecessors, although their soundness is devoutly to be wished; as we should then, if I understand them aright, be relieved from much of the perplexity that now attaches to us in their management. If correct, operations for the removal of the malignant masses would, unless as inconveniences, be entirely dispensed with; seeing that, as soon as the vegetable substances had begun to exert their benign influence on the economy, further effusion, through the increased globularity and firmness imparted to the blood-corpuscles, would be diminished; and when the system had been fully brought and kept under their power for a time, no hemorrhage—no cancerous deposit—could take place.

The question of operation in cancerous affection is one of momentous interest, both as regards the frequency of the disease and the issues it involves. There can be no doubt that two very distinct classes of cases present themselves in practice: one, in which the cachexia (so far as its external expression at least) does not occur; and another, in which it is clearly marked in varying degrees of intensity; that in the one class operations have been much more successful than in the other, both as to the cure of the disease, and, where it *has* returned, as to the prolongation of life. In the former class, the local disease *seems* to precede the cachexia, which its advanced stages introduce; and in the latter, the cachexia appears to precede the local disease. The works of Professor Walshe and the statistics of Mr. Paget shed terror into the minds of surgeons as to the propriety of operation at all; and certainly, had the statements of these high authorities been substantiated by their enlarged experience, it would have been well for humanity had operations been abandoned. But Mr. Paget has, with enlarged observation, materially altered his conclusions; and instead of the former announcement,—that operations shortened the lives of their subjects by many (by thirteen) months,—he now intimates the cheering intelligence that, in well-selected cases, the operation will prolong life; and that the proportions of deaths within the first two

years, in those operated upon, has been less than in those left alone, amounting in the former to less than 11 per cent., and in the latter to 30 per cent. The propriety of operation must then be, as heretofore, decided by individual conditions. If the cachexia is slight, or not apparent, and there is no family proclivity to malignant disease,—when the local ailment can be freely removed, and no other contra-indicating reasons in the way of existing disease in other organs can be found,—we ought undoubtedly to operate. In cases of worse aspect than this, with the advantages we now possess in chloroform, we are justified in operating; but when the cachexia is strongly marked, the local disease extensive,—although it can be encircled by the knife, where disease of a like or other kind is found involving other organs,—we shall best consult, I believe, our patients' welfare by declining operations, and trusting to the relief afforded by soothing applications.

I need say nothing as to the curability of cancer otherwise than by caustics or the knife, as—although Velpeau, Cloquet, and some others, still insist that it is so curable—the general opinion, I believe is, that when diagnosed by the microscope and the usual signs and symptoms, it is beyond the reach of cure. And I am sure I need not detain you with a history of the influences of *puccoon* in the hands of Dr. Fell. No individual, in his searchings after truth, who even dips into his treatise, can be otherwise than satisfied that Dr. Fell's performances have come far short of his professions; that indeed he has no real remedy for cancer; and that, apart from the chloride of zinc, *puccoon* "is a mockery, a delusion, and a snare."—*British Med. Journal, Aug.* 15, 1857, *p.* 698.

11.—ON THE TREATMENT OF CANCER.

By T. Spencer Wells, Esq., Surgeon to the Samaritan Hospital.

[In the early non-ulcerated stages of cancer, our art is not so powerless as is sometimes asserted; for growths with all the characters of cancer have occasionally disappeared under the influence of remedies, others have remained completely dormant for years without affecting the health or shortening the life of the individual. What must be our treatment then in these cases?]

In the first place, in the treatment of cancer, the hygienic measures so necessary in the treatment of all chronic diseases, are of paramount importance. Plenty of good wholesome food, a well-drained, well-ventilated house, pure country air, extreme cleanliness of person and clothing, sufficient exercise, clothing which exerts no injurious pressure on the diseased part, with mental occupation and amusement, will do a great deal towards the formation of healthy blood, the deposit of healthy tissues from it, and the removal of effete matter or formations of a low aplastic character. Ordinary medical treatment cautiously adopted may assist the hygienic treatment very materially. Deficient action of skin, kidneys, or digestive organs may be corrected.

Alkalies given with or after meals often relieve a kind of digestive derangement common to cancerous patients. Hence the use of Vichy water and carbonate of soda. Pain may be alleviated by opiates or hemlock. Some of the preparations of iron often act admirably in improving the general health. Well-marked cancerous tumours have diminished in size and become quite dormant under the use of iodine in combination with iron; and the iodide of arsenic, in doses of one-sixteenth to one-twelfth of a grain twice a day, has been used with excellent effect since it was first recommended by Dr. A. T. Thompson and Dr. Walshe. The remedy, however, which I have found most useful is the bromide of potassium with cod-liver oil. Given in doses of five to ten grains of the bromide, with one, two, or three drachms of the oil, three times a-day, the effect upon the local tumour and the general health is really remarkable. The pain very speedily diminishes. There is, first, a cessation in the growth of the tumour, and then a process of shrinking goes on, while adherence to the surrounding parts is lessened, and a tumour which was firmly united to the surrounding parts becomes moveable, detached as it were, and is felt like a hard, moveable, senseless ball beneath the skin. The last cure for cancer advertised in London is the inhalation of oxygen; and a Dr. Birch has published a pamphlet about it in connexion with an apparatus sold by a firm in Regent-street. This, if it is not likely to do much good, can hardly do harm.

As to external remedies which may be looked on as curative, all attempts to affect the nutrition of the part by the application of leeches or ligature of nutrient arteries, must be abandoned as useless. Friction, percussion, and palpation, so much used of late by certain *rubbers* of Edinburgh and Brighton, with the hope of procuring absorption, are complete failures. Electricity and galvanism have been tried, but the results do not say much for their efficacy. The local means which really have some good effect in cancerous tumours are preparations of lead, iodine, and bromia. Lead in the form of plaster or embrocation is a most soothing application. I have seen it used very largely at the Cancer Hospital in both forms and with very excellent results. The embrocation in common use there, consisting of equal parts of the liquor plumbi, almond oil, diluted acetic acid and water, is a really useful application, allaying pain, and apparently hastening the absorption of the tissues around the tumour, indurated by inflammatory infiltration. Frictions of solutions of iodide of lead or iodide of potassium in glycerine without producing any irritation of the skin appear to be active promoters of absorption. The iodide of lead was recommended by Dr. Walshe, and is much used now by Dr. Fell. The solution of bromide of potassium in glycerine appears to be even more efficacious, but on this point I do not like to speak confidently without more extended experience.

Dr. Arnott's freezing process is really of great service. I have shown you how to apply this on a former occasion, so that I need only

say now that it is a remedy of very great value in the treatment of cancer, that it allays pain, checks growth, and has reduced many large adherent tumours to a small, moveable, indolent condition.

Then mechanical treatment is often very useful in non-ulcerated cancer. It has long been believed that the nutrition of any part of the body might be lowered, and absorption of any product of disease promoted, by methodical compression.

The plan of bandaging the mamma and shoulder is very objectionable, as it interferes with the free motions of the arm and chest, so necessary to the general well-being of the patient. As a means of producing equal constant pressure, exact in degree and easily moderated or increased, nothing equals the air-truss invented by Dr. Neil Arnott. An air-cushion, supported by a shield, is adapted to the diseased part, while a spring supported by a belt is arranged to act on the cushion in such a manner that any desirable amount of pressure can be kept up without interfering in the least with the free motions of the chest. Applied at first so as merely to support the part, and then to exercise gradually increasing pressure upon it, the results are very remarkable. The pain very soon ceases, the swelling in the surrounding parts diminishes and disappears, the large tumour splits up into several smaller divisions, and in some cases entirely disappears, not a trace of any tumour or induration remaining, while in other cases the remaining swelling is quite passive, painless, and innocuous. I saw a lady a few weeks ago with a small tumour like a walnut in her breast, quite harmless and not causing the least anxiety, which I saw nine years ago under this compression treatment, and it was then to all appearance a large cancerous tumour, on the point of ulcerating. I have not the least doubt that if the tumour in that case had been removed, either by the knife or by caustic, the patient would have been dead seven or eight years ago.

When ulceration has taken place, there are a number of local applications which are of great use. Supposing you have decided not to use either the knife or caustics, your object is to allay pain, arrest bleeding, destroy the fetor of the discharge, until spontaneous separation of the cancer takes place, and then to promote healthy granulation and cicatrization. In some cases of open cancer Dr. Arnott's freezing process acts admirably. It may cause pain for a few minutes, but it gives great alleviation for several days afterwards, and sometimes it destroys a large portion of a morbid growth as effectually as any caustic. This occurred in a case I saw lately with Dr. Brinton. The case was a most unpromising one, in a lady from the country. One breast had been removed, the disease had recurred in the cicatrix, and the subjacent costal cartilages were implicated. There was a large flabby convex growth, which we agreed to congeal. This was done by a most intelligent practitioner in the country, and I hear from him that three-fourths of this growth were destroyed, leaving a small, concave, granulating sore. If you adopt this plan, you must protect the raw

surface from the irritant action of the salt by a piece of gold-beater's skin.

The bleeding which takes place from the surface of an ulcerated cancer can always be checked by the perchloride of iron. I always keep this by me, as it is prepared in Paris at the specific gravity 45° Beaume. A piece of lint, wet with this solution, will instantly stop any ordinary bleeding; but at this strength, or even at 30°, it acts as a caustic, so that, except in cases of very free bleeding, it should be kept at hand of the strength of 15°, so that the patient or her nurse may apply it. The strength of 30° is that usually employed to coagulate the blood in nævi and varices, and I now show you the remains of a cancerous tumour which has been acted on by this solution. See how friable it is, like dry rotten leather. About five months ago I injected some of this solution into an encephaloid tumour growing from the ilium. It was then as large as my fist, and growing rapidly. I injected it by four punctures, and the result was immediate hardening and subsequent shrinking. I saw the man a few days ago, walking about in very fair health. I do not wish to say much more about him at present, than that I feel certain his life has been prolonged. I am making other trials with the perchloride of iron, and Dr. Marsden has begun to use it at the Cancer Hospital, but I do not wish to recommend it further now, than as a means of stopping bleeding.

Dr. Marsden thinks very highly of carrot poultices. Their application is rather painful, but they certainly arrest fetor, and seem to hasten the separation of the diseased part. They are said to have been introduced into use in 1766 by Sultzer, and they have certainly maintained their reputation longer than most of the remedies for cancer.

If after a cancerous tumour has separated you have an indolent granulating surface covered with an unhealthy fetid discharge, a lotion of chlorate of potass is often very useful, of the strength of five to ten grains to the ounce of water. Mr. Weedon Cooke adds a little hydrochloric acid to this, and he believes with advantage.

In any of the stages of ulcerated cancer, when there is much pain, you may use some sedative ointment spread on cotton wool. A little morphia with lard answers as well as anything, but if you like to try other sedatives there is no objection to stramonium or tobacco ointment, or hemlock or lettuce poultices. However, you will generally find pain allayed more effectually by opium given internally than by any local application, and of all the preparations of opium I think the one which can be continued for the longest time, and causes the least derangement to the stomach, is the solution of bimeconate of morphia, as prepared by Mr. Squire.

In cases of cancroid of the neck of the uterus, the epithelioma uteri, a disease very often seen at the Samaritan Hospital, Dr. Simpson's paste of dried sulphate of zinc and glycerine answers admirably. You may apply it freely without any danger of injuring any part of the

vagina protected by its epithelium, and it completely destroys the morbid growth. Here is a specimen of the hard white slough it produces. I have seen the diseased part come away entire, like the shell of a walnut from the nut, leaving a healthy granulating surface below, which has cicatrised very rapidly; and I feel certain that in all cases of malignant growths about the female genital organs we shall find the sulphate of zinc a most safe and effectual mode of destroying them.—*Med. Times and Gazette, July* 11, 1857, *p.* 31.

12.—ON A NEW CAUSTIC FOR CANCER.

By Weedon Cooke, Esq., Surgeon to the Royal Free Hospital and to the Cancer Hospital.

[In all cases in which the knife can be employed, the use of caustics should be abjured, which are barbarous, tedious, unsafe, and extremely painful. The only cases in which caustics are admissible, are those in which there is an open ulcer, having attachments to bone or to vital parts, for the sake of obtaining a healthy granulating surface, which may even in some cases cicatrize, provided the patient be well supported during the treatment.]

Granting, then, this limited use of caustics, it becomes necessary to consider what agent is the least objectionable.

I have experienced two cases, and have heard of others where chloride of zinc was employed, in each of which a severe and dangerous attack of pleuro-pneumonia followed the application, and I cannot but believe was consequent upon it. This and the pain it produces urged me to seek for some agent more free from objection. The sulphate of zinc gives great pain; the potassa fusa destroys the mass rapidly, but it grows again after this application. I tried the anhydrous sulphates of copper and iron, and very useful caustics they proved, giving less pain than others, but being at the same time too mild in their action for the destruction of large growths. Eventually the powerfully destructive nature of manganic acid was suggested to me, and Mr. Bastick undertook to combine it with a base—viz., potassa. In this combination I believe, from what I have seen of its effects, we have a most invaluable agent. This caustic contains a very large quantity of oxygen, and would seem to act by imparting this to the tissues, thus producing a chemical combustion. The pain produced is much less than that of any other caustic, and in some instances after the first minute or two there is no pain at all, and I have observed no after ill consequences. This "manganese cum potassa" caustic is a dark green powder, and may be applied very readily by the means of a small pepper-castor. A thin coating of it will remove instantly all unpleasant odour from the ulcer, and when used for reducing the exuberant growth, must be applied in a layer as thick as the tissue to be destroyed. By dropping a few drops of water upon the powder after it is applied, it will form a paste, and adhere to the

part, after which some simple dressing may be applied. By means of carrot poultices the eschar drops off in three or four days. If necessary, the manganese is reapplied in the same easy way until the diseased mass is all destroyed, and the subjacent healthy tissues granulate and cicatrize by means of a slightly stimulating lotion of potash. Velpeau has a high opinion of the sulphuric acid, but could not succeed in making a paste with it to limit its action. This new combination of manganic acid and potassa will, I hope, attract his attention, and supply him, as well as my own countrymen, with an efficacious caustic, convenient for application, less painful than all others, and free from injurious effects upon the constitution. The well-known antiseptic effects of manganic acid suggests its use in all foul and phagedænic ulcers, and I have no doubt that large crops of warts may be conveniently removed by its agency.—*Lancet, August* 22, 1857, *p.* 193.

13.—DR. FELL'S TREATMENT OF CANCER.

[The following account of Dr. Fell's "secret," such as it is, is given in full, in his own words :—]

"Many remedial agents were tried without producing the desired effect, and all efforts to cure the disease were for a long time unsuccessful, and apparently hopeless, until I heard of a root used by the North American Indians on the shores of Lake Superior, which the Indian traders told me was used by them with success in these affections. It is a perennial plant, known commonly amongst these Indians by the name of puccoon, but from the red, blood-like juice that exudes from it when cut or bruised, is called by botanists the Sanguinaria Canadensis. It grows in great abundance in the wild forests and plains of the far West ; indeed, in early spring the ground in many parts is covered by its large white blossoms. Such a plant, with showy snow-white flowers, would naturally soon attract the attention of the savage ; but when he found that whenever this plant was injured or a leaf-stalk broken it exuded a copious stream of a blood-like fluid, he immediately considered it as sacred and a great medicine. And no doubt some poor squaw, suffering from this dreadful disease, was the first who applied it, after having tried all the simple herbarium of the uneducated savage without success, and then, in despair, applied the bruised bloody pulp of the white-flowering puccoon. This extraordinary plant, although unknown to civilized man as a remedy for cancer, has been long well known as a powerful emmenagogue and alterative, and, as such, has been admitted into the Pharmacopœia of the United States ; and it is a question well worth consideration to ascertain how far its connexion and power over the uterine functions has to do with its influences in destroying the peculiar cancerous diathesis existing in most cases.

"According to Wood and Bache, 'sanguinaria, when applied to a fungous surface in the form of powder, acts as an escharotic. It has been given in typhoid pneumonia, catarrh, pertussis, croup, phthisis pulmonalis, rheumatism, jaundice, hydrothorax, and some other affections, either as an emetic nauseant, or alterative, and its virtues are highly praised by many judicious practitioners.'

"The first experiments made with the puccoon were upon ulcerative surfaces, and although requiring months of continued application, yet the removal of the tumour was effected, and the patient cured. It was then combined with various substances with a view to hasten its action; but none appeared to do so well as the chloride of zinc, for with this compound large ulcerated tumours were removed in a few weeks with comparatively little, and in many cases no pain; at the same time obtaining by absorption and by the internal use, all the good effects of the puccoon.

"The next object was to adapt the treatment to non-ulcerated tumours; and, as a preliminary step, the cutis was destroyed by nitric acid, and the paste applied; but it was found that the eschar produced by each application was so thin, that it would require a long time to remove a large tumour.

"Incisions about half an inch apart were then made through the eschar, avoiding the the living tissues, and the paste spread upon strips of cotton inserted into them daily; this plan succeeded admirably, and is *believed to be entirely original.*

"It was also found that although the action of the puccoon was much hastened by the addition of the zinc, yet it was slow enough to allow its complete absorption, thereby enabling it to exert its peculiar constitutional effects, and at the same time removing the diseased mass in a few weeks.

"The compound generally used is prepared according to the following formula:—

℞. Sanguinariæ canadensis, ℥ss. vel ℥i.; chlor. zinci, ℥ss. vel ℥ij.; aquæ, ℥ii.; pulv. sem. tritic. hibern., q. s. Mix, and form a paste the consistence of treacle.

"Sometimes the sanguinaria is used in the form of a decoction, by boiling it down in water from four to two ounces: in this case no water is used in mixing the paste.

"The proportions of the sanguinaria and zinc are varied in different cases according to the effect produced.

"This is spread upon strips of cloth, cotton, or wool, and inserted daily into the incisions; generally in the course of two to four weeks the disease is destroyed, and the mass falls out in the course of ten or fourteen days afterwards, leaving a flat healthy sore, which generally heals with great rapidity. This treatment refers chiefly to those cases that are well marked, or that have made some progress in their destructive career; but we often meet with other cases of an incipient nature, where the disease, although fully developed, is still in a

quiescent or dormant state. In such cases I often accomplish a cure by means of absorption, giving no pain to the patient, and not injuring or removing any important part, as the breast, which must occur if the first mode of treatment is resorted to. Not only is this of use in incipient cancer, but I have seen it of much use when applied to the lymphatic glands, which had become secondarily affected. In such cases, I remove the part primarily affected, *en masse*, by means of the sanguinaria paste, applying at the same time the following ointment, spread upon cotton, over the enlarged gland or secondary tumour. This ointment is composed as follows (and called the brown ointment) :—

℞. Sulph. zinci. ℥vi.; sanguinariæ, ℥ij.; myricæ ceriferæ, ℥j.; extr. opii (aquos), extr. conii, aa ℥vi.; ungt. cetacei, ℥vi. Mist. et fiat ungt.

"In conjunction with this preparation, I use an ointment of the iodide of lead, generally applying each twelve hours alternately. The following is the formula used :—

℞. Iod. plumbi, ℈j.; glycerine, ℥j.; ungt. cetacei, ℥ij. Fiat ungt.

"With a steady persevering use of these two ointments I have often dispersed incipient tumours, which I have no doubt were cancerous.

"These are the external means of treatment I employ, which, although in themselves eminently successful, yet I am not content with them alone, but also pay particular attention to the general health, ordering a nourishing and sustaining diet, besides giving internally the puccoon in small and repeated doses. A remedy that exerts so much influence when applied externally, must be exhibited with caution, I therefore seldom exceed half-grain doses, three times daily. This is given in the powder or decoction; in the former cases I give it either alone or combined with the sixteenth or twentieth of a grain of the iodide of arsenic, and one grain of the extract of cicuta made into pills; or, if given in decoction, I generally combine it with the fluid extract of taraxacum.

"The ointment of the sulphate of zinc I have been in the habit of applying with marked success, in cancer of the womb. Unlike the Vienna paste, it can be applied not only with safety, but with impunity, as it does no injury to the adjoining tender parts.

"I have also used these preparations with marked benefit in cases of lupus, both exedens and non-exedens; indeed, I have never known a case in which the judicious use of these remedies has failed.

"Indolent ulcers have long been an opprobrium to the profession from their intractable nature; in such cases these applications are most efficacious, as I have known phagedenic and indolent ulcers of long standing to be speedily and permanently cured in the course of two or three weeks. In such cases I have often accomplished a cure by using the sanguinaria alone, but even then I find much benefit in using the combinations as described in the above formulæ.

"Having given in detail the mode of preparing and applying the remedies, it only remains to state the results of the treatment as *compared* with the removal by the knife; and in doing so I shall employ the tables generally adopted by writers upon the subject—viz. that from eight to eight and a fraction out of every ten cases operated upon return within two years; whereas it is found, that out of every ten cases treated by the puccoon, only about three return in the same time.

"The first patient suffering from cancer and treated with the puccoon of whom I have any knowledge is still living, in the enjoyment of good health, although the disease was removed fifteen years since.

"Another advantage of this plan of treatment is, that a great number of cases that no surgeon, however fond of the knife, would venture to operate upon, can be treated with a fair prospect of success."

Such is the sum and the substance of *all* that Dr. Fell has to say, and which amounts to this: that chloride of zinc, to act as an efficient escharotic, requires to be more diligently and decidedly applied than surgeons have generally been disposed to use it. No one for an instant will suppose that the sanguinaria has anything to do with the operation of the really active agent. The story of the discovery of this wonderful remedy reminds us of our old friend the picture of the North American squaw with the long tresses, displaying the efficacy of the "Balm of Columbia," which also comes to us, oddly enough from "the shores of Lake Superior." Turning, then, for a moment to the action of the chloride of zinc applied as Dr. Fell recommends—a practice not by any means so original as he wishes to be believed,—we find it capable of removing tumours in certain cases in which the knife is not available. This operation it performs slowly and *most painfully*, as we have ourselves witnessed in more than one instance; so painfully, indeed, that we should never, for a moment, recommend the use of this caustic in any case in which the knife could be used.

There is not a particle of evidence in Dr. Fell's book to show that his remedies control in the slightest degree the constitutional operation of the cancerous diathesis. All his "selected cases" date from July, 1855,—a period far too brief to prove that the disease may not return. Thus, a lady came under treatment in July, 1855; in September the fungus came away; in October the disease "again re-appeared." In February, 1856, the ulcer had healed, but we learn that on

"April 16th, Dr Pettigrew and I called on Miss W—— to-day, and found her very ill from the rheumatism. I have some grave fears as to her recovery, as there appears to be some pulmonary difficulty connected with the case. The breast is quite well, and the cicatrix scarcely observable.

"April 29th. Miss W—— died this morning at 7 o'clock."

There is very little doubt that "the pulmonary difficulty" here mentioned was cancer of the lungs or pleura.—*Lancet, June* 13, 1857, *p.* 606.

14.—*The Value of Sulphate of Copper in Glossal Cancer.*—We have watched very particularly the treatment at the Cancer Hospital of cancerous ulceration of the tongue, distinguished by its deep excavated character, with some times fissures running from its sides and irregular puckerings, and very generally preceded by nodular enlargement, with difficulty in the use of the organ. Who amongst us has not felt the sensitiveness of a little pimple on the tongue, arising from a hearty supper the night before, or from some slight indigestion? These small pimples often feel very sore and tender. If they are contrasted with the pain and embarrassment in the use of the tongue affected with malignant ulceration, an idea will be gained of the really terrible nature of the latter. Patients with glossal cancer seem to resign themselves with great fortitude to their sufferings, and it is a gratification indeed to the humane surgeon to find his measures afford relief. Now, of the various substances employed by the surgeons at the Cancer Hospital as a local agent, none appear to have so much control over the ulcers as powdered sulphate of copper. This substance is very efficacious in cancer of the tongue and cheeks. It is applied by means of a camel-hair pencil, generally twice a day, and allowed to remain four or five minutes; the mouth is then freely washed out with tepid water. It produces some pain, but this is willingly borne when the relief is found to be so great; and an excellent wash of borax, half an ounce to a pint of water, used frequently during the day, keeps the ulcer and the tongue clean and fresh-looking. Under the use of the copper, we have seen the ulcers slowly heal up and cicatrize, and a return to comparative comfort, as contrasted with the patient's previous condition.

On the 25th of August, a man from Farnwood, Matthew T——, aged sixty-two, presented himself for the first time with a deeply excavated, cancerous ulcer of the right side of his tongue, extending towards its base. It had been existing for two years, and fears now were entertained that the disease would extend to the roots, and destroy the organ and the patient's life. The treatment adopted was that we have described, with the addition of a soda powder twice a day for a week or ten days. We have no doubt that this plan will prove of service here, as it has already done in so many others.

Powdered sulphate of copper is an agent of great value, which cannot be underrated in these painfully distressing cases. We may remark, as a rule at this hospital, anodynes are avoided as much as possible, and pain is sure to become less under the sustaining treatment so commonly the practice here.—*Lancet, Sept.* 12, 1857, *p.* 273.

15.—On the EMPLOYMENT of CALCAREOUS SALTS in the TREATMENT of RICKETS and other MORBID CONDITIONS. By Dr. W. Budd.

[Dr. Pidduck has recently recommended the employment of calcareous compounds in the treatment of certain states of defective nutrition,

Dr. Budd considers that the most striking illustration of its good effects is in the treatment of rickets.]

But short of rickets, which may be regarded as an extreme case, there are many states of very common occurrence in which their remedial power is no less manifest. Among the out-patients of the Bristol Royal Infirmary are numbers of children with large heads, tumid bellies, and pasty complexion; whose spines are too weak to support their bodies; who are slow in intellect and backward in teeth and speech, and who have reached the age of sixteen, eighteen months, and perhaps more, without ever having shown any desire to take to their feet. These characteristics, varying, of course, more or less in degree, make up a pathological portrait which most physicians to large hospitals situated in great towns will recognise as the type of a numerous group. In all such cases I have for many years past been in the habit of giving a simple combination, consisting of from five to ten grains of phosphate of lime, three times a day in chalk mixture. Where there is a palpable degree of anæmia, some simple chalybeate is added to the treatment. Theoretically, bone earth would seem to be the more appropriate agent; but when I began this practice, having no bone earth at hand, I adopted as a temporary expedient the mixture I have named, and found it answer so well, that what was first tried as a make-shift has since been purposely adhered to. Nothing can be more satisfactory than this plan of treatment. At the end of a week the improvement in the patient is already very apparent; at the end of a fortnight it is, generally, conspicuous. The result is not only a rapid consolidation of the bones, but, what perhaps is still more interesting, an equally rapid development of the mental and other powers. It is no doubt owing to the nature of the case that this result is as uniform as it is complete. In these two characteristics this method reminds me more of the virtue of lemon-juice in scurvy than almost anything else I have seen in physic. The two things have probably this much in common, that, in supplying the one thing needful, they act on the same principle. Remedies which act thus have this paramount claim on the physician, that they admit of no substitute. In scurvy, unless the food or the medicine contain the antiscorbutic, all nature may be ransacked in vain for a remedy. In many of these states of defective nutrition in children, there is reason to believe that the same is true of the calcareous salt.

I have long thought it deserving of the most anxious inquiry, whether the growing deterioration and tendency to early decay which dentists have remarked in the teeth of the rising generation, may not be due to insufficient supply of the inorganic constituents of these important organs in the food by which children are nourished during the period of dental development. In towns especially, the whole mode of living, not only of man but of the animals which minister to man, is so artificial, and so few articles of diet are supplied under the primary conditions of nature, that such a contingency is quite possible. In

default of better, Dr. Pidduck's biscuits, which contain lime derived from teeth, would furnish a simple means of meeting it. Rather more than a year ago, I suggested to an eminent druggist here the manufacture of biscuits of precisely similar composition, with a view at once to the teeth-bones of these young subjects.

I may add, that if my experience do not deceive me, the same mixture is a very sure remedy in that anxious and sometimes fatal disorder, *laryngismus stridulus*. At least, in some ten or twelve cases in which I have now tried it, the speedy subsidence of the malady has followed the employment of the medicine. In some instances the cessation of the morbid phenomena has been so rapid, that I have been led to suppose the virtue of this calcareous mixture in this last disease must be due simply to its antacid properties. But this is a question into which I have not cared to inquire.—*British Med. Journal, June* 13, 1857, *p.* 514.

DISEASES OF THE NERVOUS SYSTEM.

16.—ON TETANUS.

By Dr. S. H. Hobart, A.B., Medical Officer, Cork Dispensary.

[How can we best remove the source of irritation? This is the first question which the medical practitioner is called on to solve on being called to treat cases of tetanus.]

Should it be caused by a bad injury, such as would of itself materially endanger the limb, independently of the complication with tetanus, let amputation be at once resorted to; but should the injury be of a less serious nature, and be so situated that the nerves leading from the part can be readily divided, then by all means let the preference be given to this milder course; but, notwithstanding the success attending this plan of treatment in Dr. Murray's case, and the high opinions entertained of it by some writers, yet it must be admitted that, though a milder operation, it is applicable to comparatively few cases; we can but seldom be sure of what nerve, or how many of them, may be in error; nor, even should this be decided, would it be always possible to divide those that we should wish, without the risk of leaving a paralyzed and useless limb, or of wounding some other important part. In other cases the wound may be very trifling, one affecting merely the skin, in which case no demonstrable nerve may be ascertained to be injured. Under such circumstances we may resort to the expedient referred to by Mr. Cooper as being so successful in University College Hospital, and also spoken favourably of by others, viz.: almost surround the parts with deep incisions, or, what would appear still more satisfactory, excise the injured parts altogether, and bring the edges of the new wound together. And, indeed, should this operation not prove almost immediately successful, we ought then to consider what nerve supplies this portion of integument, and at what

part of its course can it be easily and safely divided. I would venture still to hope that this secondary operation might be attended with benefit, even after the excision of the injured part had failed, on the supposition that inflammation may have extended up the nerve for a short distance; and that this may, in some instances, be capable of keeping up the disease, on the same principle of reflex action, while yet the medulla oblongata had not suffered any injury; and the fact that the nerves of the affected limb have been often found in an inflamed condition shows the possibility of this theory.

The success of any of the above means must, of course, mainly depend on the promptitude with which it is undertaken; if done in the very early stage, we may fairly hope that the disease will be thereby arrested, but this can occur only in case the local irritation is still the sole cause. But suppose the secondary cause has already commenced in the medulla oblongata, may we not expect that some advantage may still be derived from the same treatment? If irritation "transmitted to the nervous centre," &c., be in the first instance capable of producing the disease, it must, after another cause for the same is established, be still calculated to produce the same result. And thus, there being two causes in operation, the effect must be doubled, but when the primary cause is removed we have then but one condition to treat, namely, that of the nervous centre, which we may hope to cure by appropriate treatment, without the danger of its again returning, whereas, had we even succeeded in curing it while the primary cause remained, it would, in all probability, be again renewed by the same means by which it was first excited.

With regard to the more extensive use of chloroform, as also of nicotine, the wourali poison, and similar medicinal agents, I would be very cautious of pronouncing any of them deserving of the name of a cure for tetanus. They will arrest the spasms, and thus relieve from much suffering, and if the system be brought early and fully under the influence of any one of them, and its effect be kept up unremittingly, until the source of irritation is removed, it may possibly prevent the development of the secondary lesion in the nervous centre. But should this condition of the nervous centre (or the secondary cause as I have termed it) have already set in, it is quite evident that no remedy of this class can have any effect in curing it. But though such agents can remove neither the primary nor the secondary cause of tetanus, the fact of their allaying suffering, and the hope that they may prevent the development of the secondary cause (though they cannot cure it) renders them well worthy of our close attention. Let us inquire, therefore, which of those agents is the best suited to our purpose, which will act most directly on the disease, and which has the least ill effect on the system generally? The object in all cases is to produce paralysis of the voluntary muscles; this is accompanied, where chloroform is used, by a complete loss of consciousness, preventing the patient from describing his own feelings, a most important

guide as the case advances; he is also unable to call for food, or to take it if offered to him, unless he be allowed to recover, in some measure, from the effect of the anæsthetic, and then, as soon as consciousness begins to return, the muscular contractions reappear in equal proportions. There is another objection which I conceive exists against the use of chloroform in cases of tetanus, namely, that of causing congestion of, and even effusion into, the bronchial tubes, upon which points I have made some remarks in describing a case of tetanus, in another part of this journal. Nicotine, on the other hand, seems to be capable of producing the desired effect without interfering with the mental faculties; in fact, it brings the system into a state almost the direct reverse of tetanus. It appears also from recent experiments that it is likely to prove useful as an antidote against strychnia. Professor Haughton has lately read before the Irish Academy an account of some experiments performed by him, on this question, with the following results:—Frogs placed in a solution of nicotine, were quickly paralysed, and died in a state of complete relaxation; others placed in a solution of strychnia died of convulsions; but when others were placed in a combined solution of the two agents, though this was amply strong to cause death by either, it only caused slight convulsions, and that after a long immersion, and the frogs, on being removed from the bath, soon recovered; and had it contained a little more nicotine, there is little doubt but that the effect of the strychnia would have been completely neutralized. Now, as the symptoms of tetanus and those of poisoning with strychnia are almost identical, it may fairly be expected that nicotine would be equally useful in the one as in the other. Still there is one strong objection to the use of this medicine in such cases, namely, its extremely depressing effects on the circulation.

Now, tetanus itself so debilitates the system, that quina, wine, and broth, are of late among the most favourite remedies; and when we attempt to cure such a disease with, perhaps, the most debilitating agent in the Materia Medica, the risk must be obvious. It therefore remains to inquire, are the same objections applicable to the use of the wourali poison, or is it capable of paralyzing the voluntary muscles without interfering with the action of the heart. On this point I would refer to an experiment by Dr. Pavy, of Guy's Hospital, the principal features of which were as follows:—A pup, four or five months old, had a small quantity of the poison introduced under the skin of the back: the animal soon became weak, and shortly was quite unable to stir; the limbs and the body became perfectly flaccid, and at last all appearance of life ceased. Meanwhile, a tube had been introduced into the trachea, and as soon as the animal was unable to breathe naturally, artificial respiration was established, and the heart's action, which had previously become very feeble, was quickly restored, and it continued to act firmly and regularly so long as artificial respiration was continued, showing that wourali kills by paralyzing the

voluntary muscles, and, among others, those of respiration; death therefore resulting from asphyxia, while the heart's action is not at all affected, except as the result of impeded respiration. By another experiment he found that, under the influence of strychnia, also death by asphyxia was the result: but in this case the thorax was fully inflated and rigidly fixed, while with the wourali it was collapsed and flaccid. This rigid condition of the chest was found to render artificial respiration very difficult; but on raising the sternum and allowing the pressure of the air to act on the lungs and assist in expiration, it was easily established, and, as in the former experiment, the heart, which had almost ceased to act, quickly recovered in the same manner. The opposite and counteracting effects of strychnia and wourali have been more fully illustrated by Dr. G. Harley, viz.:—"1st. A frog was poisoned with 1–500th of a grain of wourali. Three minutes after he had become perfectly insensible, 1-120th of a grain of strychnia was injected: in five minutes he became tetanic. 2nd. A frog was poisoned with 1-120th of a grain of strychnia: three minutes after, tetanus was strongly marked. He was punctured with 1-500th of a grain of wourali: in seven minutes tetanus disappeared. 3rd. 1-500th of a grain of wourali, and 1-40th of a grain of strychnia, were injected into the abdomen of a frog: in five minutes it became very tetanic, in twenty minutes more it was perfectly flaccid, and next day was perfectly well." (Braithwaite's Retrospect, vol. xxxiv., p. 430.) These experiments again would encourage us, from the analogy already alluded to, to hope that wourali might have a like influence on tetanic spasms.

There is another question, however, which arises in considering the value of each of those agents, namely,—By what means do they occasion paralysis? Is it by their action on the nervous system, or by some influence over the muscles themselves, independently of all nervous supply? The chloroform and nicotine act on the nervous system there can be doubt, but the *modus operandi* of wourali is much less known, as being a rarer and more novel agent. Dr. Pavy states that it acts on the nervous system; for that, if any of the nerves be irritated, or an electric current be passed along them, no muscular action is produced, but that if a current be passed through the muscles themselves, they immediately contract. He does not appear, however, to have proved this himself by any particular experiment, but only states it as a fact. I have good reason to know, however, that by a series of experiments lately conducted in Paris, and which will be shortly published, it has been proved that on this point Dr. Pavy is in error, as I have been informed by an eye-witness, that in the experiments alluded to, electricity, passed through the muscles of an animal under the influence of wourali, did not cause the slightest contraction; but that when the muscles of an animal paralysed with nicotine were electrified in the same way, they contracted freely. In either cases irritation of the nerve, or electricity passed along a portion of it, did not cause contraction. This proved that either the nerves or muscles were para-

lyzed ; in the case of the nicotine the muscles were proved not to be affected, as they contracted when the stimulus was applied directly to them ; and in the case of the wourali it was shown that they were affected, as they did not contract. We may therefore conclude that wourali acts on the muscles, but has no influence on the nervous system. I regret that I am unable to enter more minutely into those experiments, but as they have not yet been made public by the investigator, I am not at liberty to speak more fully.

This question, as to the *modus operandi* of wourali, &c., is I conceive a matter of no small moment in the treatment of tetanus. But in order to explain its importance, I must here beg to revert to Dr. Copland's theory, that the secondary cause of tetanus (that affecting the nervous centre) is caused by the violent action of the muscles, &c., for in this he appears to be in some measure in error, though until we come to consider the action of such a medicine as wourali, the errors appear to be merely technical. Thus he looks upon the muscular contractions as demanding an increased supply of *vis nervosa*, and that, to supply this, increased energy was necessary on the part of the nervous centre, and hence the increased vascularity, as if the muscular contractions were the cause of the nervous force being developed; whereas, if we consider for a moment, we must see that it is the irritation transmitted from the injured part that induces an increased excitement of the nervous centre, which then develops the nervous fluid in unwonted quantity, and that the fact of the muscles not contracting under the influence of this nervous force, either in consequence of their being paralyzed by wourali, or any other cause, cannot diminish the excitement of the nervous centre, nor prevent the development of the secondary cause of tetanus. But as nicotine and chloroform have at least some action on the nervous system, they may be capable of rendering it insensible to the irritation transmitted from the local injury, in which case they would prevent the development of the secondary cause as long as their influence was fully kept up. I would, therefore, recommend that if it be impossible to remove the local irritation (i. e. the primary cause), one of those agents should be used, but if this be got rid of, the preference should be given to the wourali, in consequence of its not acting on the heart or other involuntary muscles. The surgeon should, however, be fully prepared to keep up artificial respiration in the event of that function becoming seriously embarrassed.

If, however, we hope to cure tetanus after the secondary cause has commenced, we must not depend on those agents alone. We should use one or other of them on account of the good effects already alluded to, but we must at the same time pay due attention to the nervous centre, and remember that this is the part now chiefly engaged. It must be admitted that many cases of tetanus have been treated very actively for myelitis and spinal meningitis, and that the result does not warrant our pronouncing it a more successful plan than some

others; but then it is to be remembered that while this was being attended to, other means were neglected; whereas, I have no doubt that if ever tetanus be brought to rank as a disease amenable to treatment, it will be by the adoption, not of any one plan of treatment exclusively, but by a combination of all the means that are indicated in its different stages:—

First, the removal of the primary cause (the local irritation.)

Secondly, in the event of this not proving efficacious, our attention is to be turned to the consideration of the secondary cause, and meanwhile we must endeavour in all stages to allay the convulsions by the the most appropriate agents; nor are we to be unmindful of such means as the peculiarities of each case may require, as stimulants, antiphlogistics, tonics, sedatives, purgatives, &c.—*Dublin Quarterly Journal, Aug.* 1857, *p.* 140.

17.—*Treatment of Chorea.*—Dr. Barlow still continues the employment of the iodide of zinc in the treatment of chorea when complicated with struma—a remedy which he introduced into use, and to which we then adverted, about two years ago. In cases in which there is no peculiarity of diathesis he employs the sulphate, but in those cases in which any indications of struma exist he prefers the iodide. Besides its influence over the scrofulous cachexia, it is quite possible that the iodic element may be useful against the rheumatic diathesis to which the choreic is so close a congener. Good authorities are not wanting who would account for the frequency of heart complications with chorea by supposing that the latter is a condition very closely connected with rheumatism, depending upon similar causes, and occurring more frequently in those liable to it than in others. A little girl was discharged the other day from under Dr. Barlow's care in Guy's, in whom, under a course of the iodide of zinc for chorea, a loud cardiac bruit had very much diminished in intensity.—*Medical Times and Gazette, Aug.* 22, 1857, *p.* 195.

18.—CASE OF NEURALGIA OF THE ISCHIATIC NERVE, TREATED BY DR. A. WOOD'S NEW METHOD OF APPLYING THE OPIATE DIRECTLY TO THE PAINFUL POINTS.

By Dr. Geo. Lindsay Bonnar, Cupar, Fife.

[The pain in this case had a morning and evening exacerbation, and various erythematous patches appeared in different parts of the limb. The saccharine carbonate of iron and anodyne draughts were administered.]

The pain along the course of the nerve, and various degrees of occasional mitigation, gradually increased in severity, generally maintaining its periodic character, notwithstanding the application of various remedies, external and internal, until the usual means recommended in such cases were well nigh exhausted.

A strong embrocation, composed of compound tincture of camphor and Fleming's tincture of aconite, was rubbed into the hip and down the limb, morning and night; at first, with a very slight improvement, which, however, soon disappeared. The parts were repeatedly subjected to fomentations of hot turpentine, until the skin became too tender and fiery for the application; this in some measure mitigated the pain for the time being, but never overcame it. Acupuncturation was also persevered in, not only over the hip, but all along the course of the nerve, even to the ankle, to which part the pain had gradually extended; and, from the decided improvement which took place, I had reason to hope that the continued use of this remedy would be productive of a cure. But, no! like all the other efforts to this end, it proved abortive, and, in the long run, had no effect even in temporarily lessening the pain. The modified cautery was also put in requisition, at a temperature considerably above 212° Fahr., sufficient in many parts to raise the skin in small blisters; but this remedy, generally powerful in relieving deep-seated pains, failed to give any other than a very partial and evanescent benefit. I proposed to vesicate the surface, and apply morphine to the denuded part; but, from an unalterable prejudice, my patient would not any account submit to have the skin broken.

Meanwhile, almost every internal remedy which seemed calculated to effect an improvement in the patient had been administered. The iron treatment was followed by the iodide of potassium with sarsaparilla, which was for some time persevered in. Arsenic was given to the utmost limits prudence would allow; but no improvement took place. The patient's strength was much impaired by the continual pain, which latterly had become excruciating; her limb was useless; her rest broken; her very existence made miserable. The least motion of the leg, the slightest turn of her body, brought on a paroxysm of agony; so that, in those intervals of comparative ease which she sometimes had, her enjoyment of life was destroyed by the constant anticipation of a sudden attack of acute suffering.

The only recommended remedies to which I had not had recourse during the persistence of this attack were croton oil internally, and, failing this, colchicum. But there were decided objections to both, as well as to any drastic purgative whatever; for a short time previously the patient had laboured under a very severe attack of dysentery, and was excessively weakened thereby: and this had left such a peculiar irritability of bowels for a long time after the severity of the disease had passed away, that I was afraid to employ any remedy which might possibly reinduce such a state.

It was now the beginning of October, and fully two months since the disease had manifested itself in a degree so severe as to require medical aid. As all that had been done had given only very casual relief, and the disease had gained ground steadily and surely, the relatives got anxious, in which state of mind I also shared, and it was

agreed to consult Dr. Alexander Wood, of Edinburgh. Accordingly, I wrote to him, having been made aware, previously, of his proposed new method of treating neuralgia by the direct application of opiates to the painful points, and he saw the patient on October 5th.

Judging it to be a case of pure neuralgia, and well adapted for treatment by his new method, he proceeded at once to put it into practice. Having ascertained which was the most painful spot, by means of careful pressure along the seat of pain, just where the nerve escaped through the notch from the pelvis, he inserted the perforated steel nozzle of a small glass syringe, into the graduated body of which had previously been put twenty minims of Battley's sedative solution; and after the instrument had penetrated about an inch and a half, the fluid was sent home with gradual and firm pressure. The effect was instantaneous. The patient immediately began to saw the air with her hands, as if in a deep dream; in a few seconds they dropped powerless; her breathing became long and deep, and she lay in a profound sleep. This continued until an early hour next morning, when she awoke refreshed and reinvigorated, as if from a night's natural rest—the first she had had for many a long week: to her great delight, she was completely free from pain, and able to move her limb very readily without uneasiness. This was, however, too sudden and too complete to be expected to last long; there was still an acute twinge of pain when the thumb was pressed firmly down on the spot; but the patient was so delighted with the general effects of the treatment, that she readily—nay, anxiously, submitted to its frequent repetition.

Oct. 6th, 7 A.M. Twenty minims of Battley's solution were injected into the hip, which did not seem to produce the same immediate effect as last night's application.

Oct. 6th, 8 P.M. The patient had slept most of the day. The pain had disappeared; it was very obtuse at the hip on pressure, and more acute down the limb, but not at all of that lancinating character it was before. As the peroneal nerve seemed to be the part in which there was most pain, ten minims of Battley's solution were there injected, and the patient was left for the night.

Oct. 7th to 10th. The same treatment was continued morning and night, injecting at the one visit into the hip, and at the other into the leg, choosing the most painful parts, as indicated by pressure. The quantity was increased to forty minims daily.

Oct. 11th. The remedy was intermitted; but the pain, on the day following, threatening to return a little more severely than before, it was resumed for four days more, at the end of which time the pain had entirely disappeared (even on testing the state of the nerve by a smart blow) from the regions of the hip and leg, and was confined to the region of the external malleolus. The treatment was discontinued from this date, with the exception of two occasions, October 20th and 23rd, when on the former twenty, and on the latter thirty minims were injected in front of the tendo Achillis, where the pain lodged very severely, but was relieved by the injection.

After this, the pain seemed to spread itself all over the dorsum of the foot, where at times it was very severe. Instead of further employing this new cure, which seemed to be now inapplicable to the case, from the very superficial seat of the pain, and the great extent of surface over which it spread, I recommended the cold douche every morning, and to be continued each time as long as it could be borne by the patient. This was faithfully persevered in, and after a short period the pain became much modified, and of quite a chronic character; in fact, it seemed to degenerate into a kind of nervous rheumatism of the part, and indicated the changes of weather in regard to rain, frost, thaw, &c., by those peculiar gnawing sensations which all martyrs to rheumatism so well know by their experience.

At this date (August, 1857), nearly two years after the occurrence of the above case, the patient enjoys very excellent health, and never experiences the slightest throb or pain in the limb. She told me jocularly, not long ago, that she almost forgets which limb it is which was affected.

Remarks.—I have allowed a sufficiently long time to elapse since the case occurred to do away with all doubts as to the permanency of the cure; and my conviction is now, as it was at the time, that in the application of anodynes to the seat of painful nervous affections, by this novel method, we have added to our therapeutics a mode of employing powerful remedies, for which the profession and suffering humanity stand much indebted to the talent and ingenuity of Dr. Wood. Since the above case, other instances have come under my observation and occurred in my practice which serve to corroborate my opinion of the value of this mode of treating neuralgic affections; but I prefer giving the details of the foregoing case alone, as it seems to bear such unequivocal testimony to the value of the remedy as could only be weakened by adducing other and less perfect cases alongside. In it, I had the opportunity of fully testing the powers of the other remedies usually recommended in similar cases, save those from the use of which I was precluded by special circumstances, as alluded to in the narration: all of which appeared abortive. During the process of cure by injection, all other means were suspended, except a recurrence to the use of an iron tonic, for the purpose of repairing the energy of the system, much spent by previous suffering. Indeed, the simple efficacy of the one mode of treatment put in juxtaposition with the usual routine of blistering and dosing, which constitute the other, admits of strong contrast, but no comparison.

The instantaneous effects of the first application of the narcotic surprised me much. I confess that I should have felt very considerable alarm at the sudden plunge which the patient made into the depths of narcotism, had not Dr. Wood assured me that he had seen the same in other cases, and that it had never been followed by any unpleasant result. This constitutional effect of the remedy subsided almost as suddenly as it had been evoked; for it was scarcely mani-

fested in any other form than drowsiness on the second occasion, and subsequently not at all, while its local effect seemed to undergo no diminution. There was here exemplified the most perfect adaptation of *cure* to *disease;* for, while a host of sympathetic constitutional symptoms became developed because of this local affection, as soon as the remedy had been applied directly to the diseased point, and had proved effectual there, the general system, relieved from an incubus, rapidly improved, the appetite returned, and every disturbed function resumed its normal condition, while the limb itself, which had become remarkably atrophied, gradually assumed a firm and full appearance, like its opposite.

For a full account of the application of the remedy, with cases. I beg to refer to an admirable paper by Dr. Wood, in No. 203 of the "Edinburgh Med. and Surg. Journal," April, 1855.—*British Med. Journal, Aug.* 29, 1857, *p.* 733.

19.—*Case of Wrist-Drop in a Compositor from local Lead-poisoning.* (Under the care of Dr. HYDE SALTER.)—[The patient, who had previously enjoyed good health, had for about a week been using new type, which, from the sharpness of its edges, had worn the skin off the extremities of the fingers of his right hand. Two days before his admission he began to lose the power of his right wrist, from the absorption of lead by the denuded surface, and the paralysis was complete on his admission.]

From the local application of the poison, and the local limitation of its results, Dr. Salter determined to treat it locally; and bearing in mind the strong affinity of sulphur for lead, the ease with which the salts of lead are decomposed by sulphurets, and the facility with which the skin both absorbs and evolves sulphur. he determined to confine his treatment to soaking the hand and wrist in a solution of sulphuret of potassium, and thus to eliminate the lead. The solution was made of the strength of one ounce of sulphuret of potassium to ten ounces of water, and the patient ordered to keep his hand in it for three hours at a time. thrice in the twenty-four hours—nine hours in all; the solution to be tepid. No other treatment was adopted. In two or three days, the power of the hand and wrist began to return; in a week. the hand was as strong as the other, and the patient left the hospital well. Doubtless the thoroughness with which the treatment was applied tended greatly to the rapidity of its results.

There are two points of interest in this case, besides the effect of the treatment, illustrative of the differences between the wrist-drop of painters and that of compositors. It is always the right hand (we do not think the left ever) that is affected in compositors; in painters, it is generally both. In compositors, the hand is affected locally, before the system; in painters, secondarily to its introduction into the entire body; so that in compositors, you get wrist-drop first, then the blue line of the gum, and colic, (if ever;) in painters, the order is reversed.

These differences evidently depend on the different method of the introduction of lead into the body: in painters, by respiration, with their food, and by their skin generally; in compositors, through the ends of the fingers of the right hand, with which they handle the type.—*Lancet*, *June* 27, 1857, *p.* 649.

DISEASES OF THE ORGANS OF CIRCULATION.

20.—ON THE SOUNDS OF THE HEART.

By A. T. H. Waters, Esq., Lecturer on Anatomy and Physiology at the Liverpool Royal Infirmary School of Medicine.

From the time of Laennec up to the present day, as many as twenty-nine theories have been proposed to account for these sounds. I now proceed to give you the principal ones held at the present day.

We have, as alleged causes, 1. Impulse; 2. *Bruit musculaire;* 3. Tension of the auriculo-ventricular valves; 4. The rush of blood through the narrowed orifices of the great arterial trunks; 5. The collision of the particles of blood with one another, and with the parietes of the heart; and, lastly, the pressing back of the semilunar valves. Such are the theories with regard to the first sound. With regard to the second, scarcely any difference of opinion exists; it is acknowledged to be due to the closure of the semilunar valves.

Let us now examine the various causes above alluded to. That impulse has nothing whatever to do with the first sound, is most satisfactorily proved by the following experiment; viz., that on removal of the anterior part of the thorax, and on placing the stethoscope on the surface of the heart itself, the sound is in no way whatever diminished in intensity, but if anything more distinctly heard than before. This observation was made by Dr. Hope, and has been confirmed by all subsequent experimenters. Independently of this demonstrative proof, it is difficult to imagine how the impulse could produce a sound, inasmuch as the heart does not strike the chest, always being in contact (in a state of health) with its anterior wall; but simply makes it bulge, as the ventricles during contraction assume a globular form.

I pass over for the present the second and third causes assigned, and come to the fourth, viz., the rush of blood through the narrowed orifices of the great arterial trunks. This view is assumed from the fact that sound is produced by pumping fluid through tubes out of the body, and further that whenever the calibre of a vessel in the body through which blood is circulating is diminished, a sound is produced. That such an analogy as is here assumed, exists between the forcible and sudden pumping of fluid through an inert tube out of the body, and the action of the heart in impelling its blood into the elastic and yielding vessels situated at its base, I cannot admit; nor is the condition of these vessels at their origin at all similar to that of a com-

pressed artery. There is no natural impediment to the onward flow of the blood, the parts leading to the vessels are perfectly smooth, and the vessels themselves are of so elastic and yielding a material, that they dilate in every direction when they receive the blood, as can be readily felt if they are grasped during systolic action of the ventricles. If the arterial orifices were compressed during the time the blood was passing through them, so that their shape would be altered and their calibre diminished, then the same result would take place as in the arteries elsewhere; but no such compression occurs, nor is there any augmentation of sound, over the base of the heart as there ought to be if this view were correct; on the contrary, when the heart is exposed, and a stethoscope applied to it, the sound is found to be most intense over the situation of the auriculo-ventricular valves.

That the fifth cause assigned, viz., the collision of the particles of blood amongst themselves and with the parietes of the heart, a view advocated by some physiologists, can be an element in the production of the first sound, I can scarcely imagine. It appears to me that if such were the case, it would produce an almost continuous murmur, for there must be collision equally during diastole of the ventricles, and especially when the contents of the auricles are propelled into them, as during systole, and sound ought to be produced during the one act, as well as during the other; but such is not the case: no audible sound is produced by the propulsion of the blood into the ventricles, and it is but fair to infer, that none is produced by its propulsion from them.

I pass to the consideration of the muscular sound, the *bruit musculaire*. It has always been the opinion of physiologists that the contraction of the muscular walls of the ventricles, was either the sole cause, or an element in the production, of the first sound. Dr. Hope adopted the latter view, and it is generally entertained at the present day.

If you place your ear or a stethoscope over a muscle during its contraction, you will hear a sound, but in its character it differs entirely from the first sound of the heart. Perhaps you cannot have a better example of the sound produced by muscular contraction, than that afforded by the action of the masseter muscle. If, when your head is resting on a pillow, you forcibly contract your masseter muscle, you will hear a rumbling noise—a noise which continues during the contracted condition of the muscle, and is also heard during its relaxation. The exact cause of this sound I am unable to tell you. It may be due to the change in shape of the muscular fibres—it may be due to the alteration of the circulation—or to some other cause; but the more you examine it, and all other muscular sounds, the more will you be convinced, that they bear no resemblance to the first sound of the heart.

Before alluding to the experiment which some of you have witnessed, and which proves beyond all doubt that the contraction of the ventri-

cles produces no sound, I think it right to bring under your notice, other arguments which tend to prove the point. If the ventricles during contraction produced sound, it is but fair to infer that the auricles would do so. We find, however, that such is not the case. If it be said that the muscular substance of which the walls of these cavities are composed, is so slight, that no audible sound could be expected from its contraction, I maintain that such an argument is unsound, and I would ask, what is the exact amount of muscular fibre necessary to produce an audible sound? Are not the auricles of a full-grown man as large, and do they not contain as much muscular fibre, as the ventricles of a *fœtus in utero?*—and shall we admit that the contraction of the latter will produce the clear audible click, with which many of you are familiar, and deny that the former can have any such effect at all? Again, presuming that the auricular fibres in man are not sufficient in number to produce a sound, are there not animals which possess auricles larger than the ventricles of some adult men?—but yet, if you listen to the sounds produced by their hearts (as, for instance, the ox or the horse), you find that they are the same in number and character as those of the human being—during the auricular contraction no sound is heard. These facts seem to me conclusive against the muscular theory, and to render it perfectly untenable.

We are not, however, without positive evidence of the truth of the assertion, that the ventricular contraction produces no sound. To Dr. Halford, who has lately brought the subject under the notice of the profession in London, and who has performed his experiments in this theatre, we are indebted for the beautiful experiment which some of you have witnessed.

The experiment consists in depriving an animal (dog or donkey) of sensation by means of chloroform; and, whilst artificial respiration is kept up, the anterior part of the thorax and the pericardium are removed and the heart exposed; on listening to the heart, the two sounds are heard. For the remaining part of the experiment, I quote Dr. Halford's own words.

"The superior and inferior venæ cavæ, and the pulmonary veins, were now compressed between the fingers, and the heart continuing its action, a stethoscope was again applied, and neither first nor second sound was heard. After a short space of time, the veins were allowed to pour their contents into both sides of the heart, and both sounds were instantly reproduced. The veins were again compressed, and all sound extinguished, notwithstanding that the heart acted vigorously. Blood was again let in, and both sounds restored. All that is claimed for the above experiment, is its exemption from any rude interference with the mechanism of the heart's action. The cavities of the heart are untouched; there is no finger thrust into the auricle or ventricle; no hooking back of valves: in fact, not one source of sound substituted for another. Both sounds are destroyed and reproduced by the same

means; the strongest argument for their both depending on the same cause, which is simply the backened current of blood, first against the auriculo-ventricular, and second against the ventriculo-arterial valves."

Now what is the value of this experiment? It proves unquestionably that there is no such thing as *bruit musculaire* in connection with the systole of the ventricles, and it disproves all the theories founded on a contrary supposition; it proves, moreover, that whenever the blood is allowed to play upon the valves, the sounds are produced.

Before Dr. Halford performed his experiments, in the original of which I assisted him, a very ingenious experiment had been performed by Mr. Brakyn, which consisted in propelling by means of bladders and tubes connected with the left side of the heart, air through the cavities, so as to represent the flow of the blood. His experiment proves that when the auriculo-ventricular and the ventriculo-arterial valves are thrown into a state of tension, by air acting on them in the same way as the blood, sound is produced. This experiment I have frequently repeated—the original apparatus used by Mr. Brakyn being still in my possession—and the sounds resemble in every respect, considering the nature of the fluid in which they are produced, those of the living heart.

These two experiments seem to me to settle entirely the question which has so long agitated the minds of physiologists. Mr. Brakyn's proves that the tension of the valves is equal to the production of the sounds, and Dr. Halford's that muscular contraction has nothing to do with them.

The pressure of the semilunar valves against the sides of the great vessels is said to assist in the production of the first sound. This requires but slight consideration. Against what are they pressed? Against the *yielding* walls of the vessels, and can there be any element of sound in such an occurrence? I think not.

I think I have now proved that all the phenomena synchronous with the first sound, except the closure of the valves, are unequal to its production, or even to assist in it; and also, that such closure is equal to produce the effect. It is then to *the tension of the mitral and tricuspid valves, produced by the blood being forcibly propelled against them*, that this sound is due.

With regard to the second sound, there is but little difference of opinion; the experiments of Hope proved that it was solely due to the semilunar valves. When the arteries recoil after being distended by the ventricular systole, the blood in them is forced back towards the ventricles, the semilunar valves then come into play, they are stretched across the vessels, and suddenly made tense, and then sound is elicited.

If you listen to the sounds carefully, you will find that they do not differ in *kind*, but only in *degree*. The auriculo-ventricular valves are large, thick, and strong; consequently their vibrations are slow, and the sound they produce prolonged. On the other hand, the ven-

triculo-arterial valves are small, thin, and comparatively weak, and their vibrations are rapid, and the sound they produce short. Both sounds may be illustrated by making tense two pieces of membrane of different size and thickness.

If the theories I have mentioned require any further confirmation, they receive it from the sounds which result when there is disease of the heart. If you hear a murmur, you know there is something wrong with the valves, you do not think of the muscular walls; you know that there is some deposit in connexion with the valves, which either from its roughness causes a sound as the blood passes over it, or else prevents the valves properly closing, and thus allows of regurgitation.

Moreover, consider the alteration in the sounds, which is the result of a change in the muscular walls. When the ventricles are hypertrophied, the first sound is less distinct, and of a muffled character; it has to pass through the thickened muscle, and necessarily comes less sharply to the ear. Again, when there is dilatation of the ventricles and thinning of their walls, the sound is clear and sharp; it has to pass through a smaller space and is less altered in its character. If the sound were due to muscular contraction, surely, in obedience to the law of physics that if you increase the cause you increase also the effect, the sound of a hypertrophied heart would be louder and more distinct than that of one in which the muscular fibres are diminished: but the contrary obtains, and this fact affords an additional proof of the valvular theory.—*British Med. Journal, Feb.* 14, 1857, *p.* 123.

14.—STIMULANT TREATMENT IN ACUTE PERICARDITIS.

The following case, recently discharged from King's College Hospital, will furnish a good example of Dr. Todd's usual plan of treatment in the inflammations of acute rheumatism.

A cachectic, pallid girl, of nervous temperament, was admitted on account of a mild attack of acute rheumatism. It was the first she had had. Alkalies were ordered, according to the usual plan, namely, fifteen grains of the bicarbonate, and five of the nitrate of potash, every four hours. On the third day a well-marked pericardial friction-sound was heard. Opium in grain-doses every four hours was now added to the alkaline treatment, and eight ounces of brandy daily were allowed. The symptoms of pericarditis rapidly became very severe. She had great pain; much dyspnœa; pulse 140; respirations often 60 in the minute. A week later pneumonia of the right lung set in. The brandy was now increased up to ℥xij., and ultimately to ℥xv., and in place of the alkaline mixture one containing ammonia and chloric ether was given. Two days later pneumonia of the left lung showed itself. On the left side the pneumonia became very extensive. Throughout this the friction-sound was heard over the entire

beats, and was very loud. No head symptoms showed themselves. There had been in the outset a suspicion of an endocardial bruit, but if it existed it became so masked by the pericardial rubbing that it could not be detected, and had ceased before the latter disappeared. The patient, when the turn was once taken, made a rapid recovery. The pneumonic dulness entirely disappeared, and she left the Hospital to all appearance quite well at the end of a month. During a week of the worst her life had been in great and hourly peril. Throughout no remedies of an antiphlogistic class had been given, no leeches used, no blisters employed. The only form of counter-irritant applied was turpentine stupes, which, on the supervention of the pneumonia, were freely used. Our readers will, probably, agree with us in considering the above an example of very bold practice. Dr. Todd is, perhaps, the most thorough-going of the revived Brunonian school connected with our London Hospitals. With regard to rheumatism in particular, we believe that he does not claim for the stimulant treatment any power of cutting short the inflammation, but that it prevents the patient from sinking under them, and enables him to convalesce much more rapidly than if depletion had been adopted. We have quoted the case as a fair illustration of the practice of one of our leading consulting men, a most sagacious Physician, and an accomplished physiologist. We do not venture to express either approval of its teaching or dissent therefrom. The ablation of a cancer by such a method does, however, prove one fact, which will be useful to the future historian of disease, viz., that during the middle of the nineteenth century disease of acute inflammatory nature here was to be cured by a treatment consisting of the most vigorous stimulation. Should, as there appears good reason to anticipate, the revolving cycle bring us in another quarter of a century to an opposite state of things this fact will not be without its value.—*Med. Times and Gazette, Aug.* 29, 1857, *p.* 219.

DISEASES OF THE ORGANS OF RESPIRATION.

22.—ON CATARRH AND ITS TREATMENT.

By Dr. C. Handfield Jones, Physician to St. Mary's Hospital.

A point which I think is not yet sufficiently understood is the almost invariable tendency to aggravation of catarrhal disorders during the night. I have observed this in catarrhs of various parts. It is commonly supposed to depend upon the accumulation of mucus, but I believe it is rather due to a lowering of the nerve-power during the night, and consequent dilatation of arteries, the vaso-motor nerves partaking in the general debility. From this cause the hyperæmia of the affected part becomes increased, more irritation is set up, and more exudation take place. There are many acts of a like import,

Asthmatic paroxysms are apt to come on after an hour or two of sleep. Those of pertussis are aggravated often at night. Fever patients are apt to sink during the night. Epileptic attacks, when the disease is yielding, often happen only at night. Malaria affects the system much more severely at night than by day. When I have had cachectic pustules on my fingers from dissecting, I have often observed that they suppurated afresh at night, after they had appeared to be healing during the day. In a communication made by Mr. Clarke to Dr. Graves, it is stated that the electricity of the atmosphere is at its daily minimum at three A.M., and that the atmospheric pressure has one of its two daily minima an hour later. All these facts, especially when regarded in connexion with the manifest depressing influence which the catarrhal poison exerts on the nervous system at large seem to me to give much probability to the opinion above expressed.

Causes.—Dr. Hyde Salter, in an able clinical lecture on Catarrh, adopts the old idea that cold is its principal cause, and considers that it operates by preventing the eliminative action of the cutaneous glands. I feel a very strong persuasion that this is far from generally true—that there is some other unperceived but real cause; and that when cold does occasion catarrh, it is not in the way Dr. Salter supposes. The following quotations afford evidence as to this point:—

Sir E. Parry states that though he and his crew were constantly in the habit, during a polar winter, for some months, of undergoing a change of from 80° to 100°, and in several instances 120° of temperature, in less than one minute, not a single inflammatory complaint (beyond a slight cold, which was cured by common care in a day or two) occurred during this particular period.

Alison, relating the effects of the cold on the French soldiers during the retreat of the army from Moscow, notices specially the benumbing of the mental faculties, the state of fatuity or idiocy into which they lapsed for hours before death, but never alludes to any occurrence of catarrh. It seems reasonable to conclude that there could not have been any prominent disorder of this kind.

A recent authoress, speaking of Lower Canada, where the winter lasts from December to April, and the thermometer is in January, 35° below the freezing point, says that she has seen a wonderful effect produced, in the early stages of pulmonary disorders, by a removal from the damp, variable climate of Europe to the dry, bracing atmosphere of this country.

Dr. Granville writes: "It is a fact which will startle my readers, that 'a cold' is seldom to be heard of in St. Petersburgh. There are, seriously speaking, so few diseases of the chest, catarrhs, defluxions, and feverish colds in the Russian capital, that I was quite surprised on hearing consumption quoted as an almost endemic complaint."

The grand river (eastern fork of the Colorado) had to be crossed by swimming the cold flood, and by scrambling and leaping over blocks of ice. In spite of every such incident, of beds on the snow under

the open heaven, and exposure to extreme severity of frost, snow-storms, and once a deluge of rain all night long, throughout this journey, says Mr. Carvelho, "I never took the slightest cold, either in my head or chest; I do not recollect ever sneezing. While at home, I was ever most susceptible to cold."

From these testimonies, it seems difficult not to conclude, that a considerable degree of cold, sufficient to check very materially the cutaneous circulation, does not exert any perceptible influence in promoting the occurrence of catarrh. Its tendency seems rather to be the reverse.

From questions which I put to some of my out-patients who were much exposed to the weather, it appeared, on the whole, to result that there was no remarkable liability to catarrh, unless they were much in the way of heat as well as of cold. The untoning, relaxing influence of heat on the nervous system seems to me the more essential of the agencies concerned in originating catarrh. When a system in this condition receives a sudden *coup* of cold, and does not react, the shivery feelings which ensue are an indication that the nervous system has received a depressing shock, and this may issue in some local affection or one more general. The reproduction of ague attacks, in those who have suffered from them, by exposure to cold, is quite an analogous case. Dr. Copland notices the converse as a not unfrequent occurrence, catarrh being induced by "coming into an overheated apartment out of a cold and moist atmosphere." I have met with more than one instance of catarrhal affections being either originated or aggravated by the supervention of thaw upon a frost. In others, again, cold has interrupted improvement. This difference must be referred, I think, to the particular states of the patients—in the one, the cold doing good by toning the vaso-motor nerves; in the others harm, by irritating the tissue. It seems to me very possible, that various causes operating after the manner of depressing poisons upon the nervous system, may give rise to the phenomena of catarrh. The principal, however, in all the more severe cases, is, I believe, the presence in the atmosphere of some malarious miasm, which, when general and potent, occasions an epidemic of influenza, but which in minor amount affects only the predisposed.

[Catarrhal affections are considered by Dr. Copland as analogous to rheumatism and erysipelas; probably, however, ague is more nearly allied to catarrh than is erysipelas.]

The relation of rheumatism to neuralgia is notorious. Instances continually occur in which it is impossible at first to say whether the disorder is pure or rheumatic neuralgia. Now, as catarrh is certainly closely allied to rheumatism, there is much reason to consider it equally allied to neuralgia, which, as Dr. M'Culloch well says, is another mode of malarious disease. The pain and general depression of a severe catarrhal attack manifestly indicate the operation of a poison on

the nervous system, and the pains are, in fact, actually so many neuralgiæ.

If we suppose the morbid influence of catarrh affecting the mucous surfaces transferred to the vaso-motor nerves of the limbs and of the synovial membranes we should certainly have results identical with those of rheumatism. The etymology, in fact, is correct, and *catarrh* is a *rheum*atism of the mucous surfaces. Another point, in which catarrh has an evident affinity to neuralgia and aguish disorder, is, that instances are not unfrequent in which attacks of neuralgic character are accompanied by exudation. Such are asthmatic paroxysms, passing off with free expectoration; lachrymation and salivation occurring with neuralgia of the trifacial; gastralgia, with its watery flux (pyrosis); sudden attacks of abdominal pain and diarrhœa taking place in some cases of remittent fever, and also as an independent affection; and certain cases of violent paroxysms of sneezing. Here the nerve disorder is temporary, and with it the vascular congestion subsides, and the exudation ceases. If it were more persistent, the result would be catarrh.

Treatment.—The treatment of catarrh is sufficiently rational and satisfactory. In cases where the local disorders are wanting, or nearly so, and the general depression and prostration, without much pyrexia, are the prominent phenomena, I find carbonate of ammonia, five grains, in cascarilla infusion, three or four times a day, of great service. In somewhat more pyrexial states, the ammonia is better given in equal parts of camphor mixture and liquor acetatis ammoniæ. Tincture of hyoscyamus, or tincture of cannabis indica, or (if there be diarrhœa) Battley's solution, may be added to the foregoing. Camphor and henbane, or morphia, or Dover's powder, may procure comfortable rest in many cases at night. As improvement goes on, citrate of iron and quinine, with tincture of nux vomica, or quinine alone may be substituted for the ammonia. If in any case there should be much pyrexia, citrate of potash, with bicarbonate of potash, and dilute hydrocyanic acid, guarded also, perhaps, with a little Battley's solution, will be very appropriate. In many cases, rest in a warm bed for a day or two, with wine negus as a gentle stimulant, and equalizer of the circulation, will alone do very much to restore the system from its depression. There is no need for any rigid diet, nor for any attempts at elimination of the catarrhal poison.

In all local catarrhal affections, the general indications are the same —viz., in the early period, to reduce sthenic inflammatory action, (supposing it to exist,) and, in the later, to give tone to weakened vessels and nerves, and to calm irritation. In catarrh of the *air-passages*, ipecacuanha, half a grain to a grain, combined in a pill with one or two grains of extract of conium, and a little morphia, if there be much nervous irritation, and given every one or two hours, so as to maintain a degree of nausea for some time, is very effectual in combating sthenic inflammation. The saline and alkaline mixture, with hydrocyanic

acid, mentioned above, should also be taken every three or four hours. There seems to me a decided advantage from giving the pill and mixture separately, as the nauseating influence of the ipecacuanha can thereby be regulated more easily, without interfering with the saline. Very decided cases of bronchitis may be conveniently dealt with in this way; some, however, occurring in the more vigorous and robust, may require the more potent influence of antimony. Mustard poultices or turpentine stupes, and in the later periods blisters, (if necessary,) may all be of much service. In cases of tracheal catarrh, where the cough is very distressing and obstinate, small blisters, applied just at the top of the sternum, are often of much avail. If there be much constitutional depression, together with the local catarrh, the skin cold, and the pulse feeble, ammonia, with the compound spirit of sulphuric ether, in cascarilla infusion, is very appropriate. Tincture of cannabis indica is a good sedative, which may be given with the above, or the extract in a pill at night; it certainly has a notable effect on the cough in not a few cases. In some cases of this character, there are symptoms of constriction of the air-tubes, (asthma,) to meet which liquor of the arseniate of potass may be added with advantage to the ammonia mixture, or extract of stramonium be given in pill two or three times a day, or at night only. When the catarrhal affection is clearly asthenic, the rales moist, the expectoration free, and the pulse weak, the greatest benefit will accrue from the use of nervine tonics, as nitric acid, strychnine, quinine. With these, sedatives may also be employed, as well as cod-liver oil, to aid in improving the various nutrition processes. It is not unfrequently a cause of some perplexity to determine at the commencement of the treatment whether a tonic or contra-stimulant plan is to be adopted. Sometimes I believe only the result of a trial will show. Senega, preceded by an emetic, is most appropriate to cases of obstructive bronchitis, or, as it has been termed, suffocative catarrh. I have seen it turn the balance in a grave and most perilous case, when all other means had failed. Dry cupping is a most useful aid in chronic bronchial catarrh; it is more cleanly and convenient than mustard poultices, and the patient's attendants can soon be taught to do it themselves, if the practitioner cannot spare the time. The balsams and squill I regard as milder forms of nerve-toners, appropriate to cases where either the stronger tonics cause irritation of the tissue, or the morbid action remains at a grade intermediate between sthenic and asthenic inflammation. I cordially agree with Dr. Copland in his reprobation of the practice of maintaining a copious expectoration for an indefinite time, which the mere routine administration of these drugs is apt to keep up.

Though I have unfortunately a good deal of (personal) acquaintance with *nasal* catarrh, I must confess I do not know of anything that has much effect upon it during the stage of active defluxion, (tissue inflammation.) Dr. Watson, however, speaks positively of the good effects of an opiate, and I have seen inhalation of the fumes of opium also re-

commended. I suppose its action must be that of a tissue sedative, somewhat as in peritonitis. When the flux is asthenic, though it may be most copious, I can answer for the good effects of bottled stout and strychnine, and the experience of others is to the same purpose. The *dry* plan of treatment (albeit I hold it in abhorrence) is by no means unscientific; it regards the need of diminishing the strain from within upon the weakened bloodvessels. I think it, however, better and pleasanter to try to tone them.

In *conjunctival* catarrh, even the most severe, the case is nearly the same as in nasal. We possess no contra-stimulant drug to be depended on for subduing the sthenic inflammation. We are, therefore, obliged to resort to direct means, as local bloodletting, and the application of nitrate of silver. The arrest of severe conjunctivitis by Mr. Guthrie's ten-grain ointment, or by the use of solid lunar caustic, is certainly a striking therapeutic effect, even if it cannot be relied on as a constant one. The exact mode of its action must remain uncertain, but I suppose we shall scarcely err if we consider it as a "vitality-moderating agent," to borrow an expression of Dr. Bennett's. On cutaneous inflammation it will often act similarly as stated by Mr. Higginbottom. When the sthenic period has passed, nerve tonics, (quinine, &c.,) have the best effects, as elsewhere.

In the treatment of *gastric* catarrh I do not know that we have any contra-stimulant drug to be at all ranked with ipecacuan and antimony in their action upon the bronchial tubes. I think I have seen good from the administration of mercurials, as grey and Dover's powder, of each two grains and a half three times a day, for a few days; but I am not so clear about their good effects in gastric as in intestinal catarrh, where they are most marked. Leeches, followed by a continued poultice or fomentation to the epigastrium, will be of much benefit in the earlier periods, and a blister in the later. Lumps of ice, and a saline and alkaline mixture, with hydrocyanic acid every two or three hours, will be very grateful as long as there is active inflammatory movement. When this has quite, or nearly, passed by, tannin, in pills, with muriatic acid either alone, or conjoined with dilute hydrocyanic acid, forms an excellent tonic, and this again may be followed by the stronger ones, as quinine or strychnine. Bismuth appears to me to find its opportunity in the intermediate grades of inflammation, or those which contain a good deal of the neuralgic element. It certainly arrests pain and muco-watery profluvia, and seems to act, in part at least, as a nerve sedative. I have generally given it with soda or magnesia in mucilage, together with hydrocyanic acid. In many cases tannin may be given at the same time as bismuth, but I regard it as a grade nearer to the tonics. Nitrate of silver does not seem to me to belong properly to the remedies for gastric catarrh; it finds its exact opportunity in gastric hyperæsthesia. Lactic acid, or pepsine, with the meals, are of course to be recommended if there be any abiding debility of the stomach, and failure of digestive power after the above means have

been fairly tried. Certain conditions of the stomach, by no means unfrequent at the present time, when there is pain and soreness, nausea, and rejection of muco-watery fluid, mingled sometimes with blood, and which are cured by quinine with opium, or citrate of iron and quinine with nux vomica, form a transition stage between catarrhal and neuralgic affections. I strongly suspect that cases allied to these, where there has been a good deal of bleeding, are often wrongly set down as gastric ulcer. I have little doubt that, especially in conditions of aguish disorder, when internal congestions are apt to occur, the mucous membrane of the stomach may bleed like that of the nose, without any ulceration. Perhaps this may apply to some of Dr. Brinton's observations.

I must notice, in passing, how unsatisfactory the term "dyspepsia," so often applied to all stomach ailments, is. It would be little more absurd if we denominated all pulmonary affections *dyspnœa*. Surely the existence of gastric catarrh, gastric neuralgia and hyperæsthesia, gastric degeneration, and gastric cancer, is perfectly established, and we ought to be able to refer every case to a position approximating more or less closely to one or other of the types just named. These ideas ought to be common and familiar, ought to be implanted in the minds of our students, and appear prominently in our text-books.

The treatment of catarrh of the *small intestine* is very similar to that of the stomach, but salines are generally to be avoided. Repeated small doses of grey and Dover's powders are of very great benefit; and if the urine is turbid with lithates, carbonate of soda should be given in infusion of lemon or orange peel. As long as there is anything like tenderness, warm fomentations should be applied to the abdomen. In some cases repeated small doses of castor oil seem to modify beneficially the irritable state of the mucous surface; they should be given with a few drops of tincture of opium. Bismuth and tannin may be of much value after the earlier stage has passed away, and in protracted cases nitric acid and liquor of per-nitrate of iron are found efficacious.

Catarrh of the *large intestine* is identical with the milder forms of dysentery. Its treatment is remarkably similar to that of bronchial catarrh. Ipecacuanha frequently administered is of great avail in subduing the sthenic inflammatory state in each, and the asthenic is benefited by very much the same tonics.

The *bladder* is one of those regions of the body which seem to be less under the control of remedies than many others. Except bloodletting and opium, there seems to be no remedy known which has any effect in subduing sthenic inflammation of its mucous lining. Copaiba is often of great power in diminishing the secretion of muco-pus, and I have found benefit also from strychnia, in chronic cases, as a tonic to the relaxed vessels. But it is most difficult to arrest the morbid action completely, and, except in the young, where the vital powers are more elastic and capable of recovering themselves, I doubt whe-

ther it is to be done. The principles of action are, however, the same as in other catarrhal states.

In *uterine* catarrh there is rarely any opportunity for dealing with the stage of sthenic inflammation, and the task of the practitioner is mainly to give tone again to weakened, relaxed, and congested vessels. An occasional blister to the sacrum may be of much service, but reliance is chiefly to be placed on cold astringent injections effectually employed (vide Dr. Tyler Smith's directions, pp. 198–200 of his work), on the alum tampon, and on various astringents and nerve tonics administered internally. Dr. F. Churchill mentions ergot, tincture of muriate of iron, decoction of hæmatoxylum, and balsam copaiba, and to these may be added quinine and strychnine, which I have found of decided efficacy.

It may be thought that in thus reviewing the common catarrhal affections of the various mucous surfaces, and classing them all as catarrhal, I have merely used one term for another without any gain. I am, however, strongly of opinion that it is a real gain to be able to view diseases as far as possible as the result of general or wide-spread influences, which, operating on the whole frame, produce in similar tissues similar effects, and which are to be met and counteracted by similar means. The practitioner who regards disease in this light will surely be stronger, and better prepared for emergencies than he who considers them as so many separate entities. I have also desired to maintain and illustrate the view that the treatment of catarrh is to be directed simply to meet and obviate the effects of a depressing, or irritating poison, without in any way endeavouring after its elimination.—*Lancet, July* 4 *and* 11, 1857, *pp.* 3, 29.

23.—*Mixture of Tannin in Chronic Bronchitis.*—M. Berthel recommends the following mixture in cases of bronchitis of long standing:—Take of tannin, three grains; extract of belladonna, three quarters of a grain; extract of conium, two and a half grains; infusion of senna, three ounces; fennel water and syrup of marshmallow, of each one ounce and a half. Mix. A table-spoonful to be taken every two hours.—*Bulletin Général de Thérapeutique.—Dublin Hospital Gazette, Aug.* 15, 1857, *p.* 253.

24.—ON THE PROXIMATE CAUSE AND SPECIFIC REMEDY OF TUBERCULOSIS.

By Dr. John Francis Churchill.

[Out of thirty-four cases of phthisis, treated by Dr. Churchill, all either in the second or third stage of the complaint, nine recovered completely, eleven improved considerably, and fourteen died. He comes to the following conclusions:—]

The proximate cause, or at all events an essential condition of the

tubercular diathesis, is the decrease in the system of the phosphorus which it contains in an oxygenizable state.

The specific remedy of the disease consists in the use of a preparation of phosphorus, uniting the two conditions of being in such a state that it may be directly assimilated, and at the same time at the lowest possible degree of oxydation.

The hypophosphites of soda and lime are the combinations which hitherto seem best to fulfil these two requisites. They may be given in doses varying from ten grains to one drachm in the twenty-four hours. The highest dose which I have been in the habit of giving to adults is twenty grains.

The effect of these salts upon the tubercular diathesis is immediate, all the general symptoms of the disease disappearing with a rapidity which is really marvellous.

If the pathological deposit produced by the dyscrasy is of recent formation, if softening has only just set in and does not proceed too rapidly, the tubercles are absorbed and disappear; when the deposit has existed for a certain time, when the softening has attained a certain degree, it sometimes continues in spite of the treatment, and the issue of the disease then depends upon the anatomical condition of the local lesion, on its extent, and upon the existence or non-existence of complications. I have made numerous attempts to modify the local condition of the lungs by the inhalation of different substances, but have never obtained any satisfactory result independent of what was to be attributed to the specific treatment. The hypophosphites of soda and lime are certain prophylactics against tubercular disease.

The physiological effects which I have observed to be produced by the use of the hypophosphites of soda, lime, potash, and ammonia, show these preparations to have a twofold action. On the one hand they increase the principle, whatever that may be, which constitutes nervous force: and on the other, they are the most powerful of hæmatogens, being infinitely superior to all medicines of that class hitherto known. They seem to possess in the highest degree all the therapeutical properties formerly attributed by different observers to phosphorus itself, without any of the danger which attends the use of that substance, and which has caused it to be almost forgotten as a medical agent. The different preparations of hypophosphorous acid will undoubtedly occupy one of the most important places in the Materia Medica.—*Dublin Hospital Gazette, Aug.* 15, 1857, *p.* 252.

25.—ON THE DISEASE OF THE SHEFFIELD FILE-CUTTERS.

By Dr. John Charles Hall, Physician to the Sheffield Public Dispensary, &c.

[During the process of cutlery, the file is placed upon a bed of lead, which rests upon an anvil. This lead is gradually worn away, and

may be collected in considerable quantities in the form of fine black powder. The file-cutters' disease results from the absorption of a portion of this lead, as is common to file-cutters, painters, lead-smelters, shot manufacturers, sheet-lead rollers, sugar-of-lead, red-lead, white-lead, and litharge workers, compositors, plumbers, potters, sealing-wax makers, enamellers of German cards, colour grinders, lead miners, &c.]

One of the most simple and at the same time one of the most effectual means for preventing the attacks of poisoning from the employment of lead is the daily use of the bath, so as thoroughly to purify the skin, and to remove from the surface of the body the particles of lead which have been collected during the day. If the file-cutters object to the daily use of the bath, then, on leaving work, the neck, face, hands, arms, and arm-pits, should be well washed with soap and warm water, and the shirt and clothes be changed, keeping one set for the house, and another for the workshop.

It was pointed out by the late Dr. Pereira, that the addition of four ounces of sulphate of potassium to thirty gallons of water much increases the efficiency of the warm bath; the sulphur of the alkaline salt combining with the lead which is present on the skin, or just below its surface, forms a dark discoloration. This is more particularly observed in the axilla, the abdomen, the inside of the thighs, the hands, and on the back. Such facts as these speak loudly in favour of the more general establishment of baths in every large town, for the use of the artisans who may be employed in it. Such public baths in Sheffield, to which our file-cutters could resort, and where they could have baths in which the sulphate of potassium had been mixed, would, I am certain, confer most important benefits on hundreds of these men, prolonging, as it could not fail to do, their lives, by removing in some degree at least the cause of lingering disease, attended as it often is for years by much discomfort and suffering.

The habitual costiveness to which the file-cutters are liable I have found best relieved by attention to diet, by the frequent use of injections, by the warm bath, by doses of sulphate of magnesia in the infusion of roses, and by taking now and then a pill consisting of the compound extract of colocynth and croton oil. Of the use of the iodide of potassium I shall speak in the next section.

Treatment of the file-cutters' disease.—I know of scarcely any subject in the whole range of medical science of greater interest, or one more deserving the most serious attention of the profession, than the examination of the chronic effects of lead on the human frame, and of which so remarkable an example is furnished in the file-cutters of Sheffield. In the treatment of this disease, our first efforts are to be directed to the expulsion of the poisonous metal from the system, and happily (since the publication of the memoir of M. Melsens, in which he has shown most clearly, by numerous experiments, that the iodide of potassium is not only a safe, certain, and radical cure for the common forms of saturnine and mercurial poisoning, but an equally sure

preventive of the injurious effects so frequently produced by emanations from lead and mercury) we have the means at our command; for I have no hesitation in stating that the iodide of potassium exerts far greater influence over the effects which arise from the poison of lead, and does more to the restoration of the body to a healthy condition than any other remedy, or combination of remedies, with which we are acquainted.

In the treatment of lead poisoning, we shall do well to keep in view the aphorism of M. Melsens, and to consider only two things, "the disease from the presence of the poison in the system, and the cure by the expulsion of this poison out of the system;" and the principle of treatment by the iodide of potassium is to render soluble any metallic compounds which have become fixed in the living body, and to facilitate their elimination by uniting them with a substance most readily cast out of the system. Melsens assumes that in all cases of *mercurial* and *saturnine* poisoning, that the metallic substance is in actual union with the affected part or parts, and that it is retained there in the form of some insoluble compound. He considers that the iodide of potassium, after its absorption into the blood, combines with the metallic poison, and forms with it a new and soluble salt, freeing the poison from its union with the injured part; thus, as it seems separating it from the damaged fibre, and once more setting it afloat in the circulation. M. Melsens having shown that the compounds formed by the union of mercury and its salts with certain of the tissues can be destroyed, and that the metal, on being dissolved by the iodide of potassium, can be eliminated through the kidneys, as proved by actual chemical evidence of the presence of mercury in the urine, goes on to speculate that the elimination of lead in the same way is rendered highly probable by the solubility of the saturnine salts and compounds in the iodide of potassium; and, by the undoubted prophylactic and curative powers of the iodide of potassium in cases of impending or actual lead poisoning. It remained, however, for Dr. Parkes, in the first instance, and more recently for Dr. Sieveking, to demonstrate that in cases of saturnine paralysis the iodide of potassium does cause the elimination of lead. That it possesses this power any of the readers of this Journal may satisfy themselves by giving it in the next cases of paralysis from lead that may be under treatment. To demonstrate its effects, th urine must be first evaporated to dryness; the residue should then be boiled with nitro-hydrochloric acid and filtered. The filtered portion, on the addition either of sulphuretted hydrogen, or of sulphide of ammonium, will give a precipitate of the sulphuret of lead, if this metal be present.

In order to obtain the full advantages of the remedy, I think it most desirable first to give a brisk purgative and a large enema. When the iodide of potassium is administered, it is important that it should be taken fasting, in order to prevent decomposition by acids, and also that it should be given *largely diluted*. I have never given

it in such large doses as M. Melsens suggests. Ten grains three times a day is the largest quantity I have yet employed. From the able translation of his memoir, by Dr. W. Budd, it will be seen that M. Melsens is of opinion that there is no evidence to show that sulphuric acid is an antidote to slow lead poisoning, but that sulphate of magnesia may be properly given in cases of poisoning by a soluble salt of lead, to act on the portion yet unabsorbed.

Although our efforts are to be directed to remove, as speedily as possible, the poison from the system, in treating the disease to which the file-cutters are so liable, certain complications will arise, requiring that means should at once be adopted for the relief of urgent sufferings: and it will often happen that in violent attacks of lead colic, opium, in some form or other, is indispensable, either alone or combined with calomel & frictions, with an opiate embrocation and injections of warm water also, are frequently useful in affording temporary relief. Obstinate constipation more generally yields to croton oil than to any other purgative. The warm bath is always of essential service.

In cases of paralysis and "wrist drop," some adequate support must be afforded to the hand and arm, and electricity or galvanism may be applied to the paralysed limbs. I find, however, in actual practice, that in the different phases of the *file-cutters' disease* all other means yield in importance to full doses of the iodide of potassium, administered in the way which I have already pointed out.

The subject of *lead service pipes*, in connection with the supply of water to the houses of all classes of the community, is one of the highest interest and importance; and one on which, did my present limits permit, a few remarks might not be out of place. That the day is not far distant when *lead*, as a means for the general distribution of water, will be abandoned, I feel certain. For my own part, being of opinion that it is, as a general rule, highly dangerous to bring water into contact with this metal, I hope that lead pipes will fall into general disuse: for why employ so dangerous a metal in any portion of the transit of water to our houses, when there exists in gutta-percha, porcelain, slate, zinc, and iron, substitutes which combine the advantages of durability and cheapness with perfect freedom from danger? The best means of purifying water from the contamination of lead is by filtering it through sand and animal charcoal.—*British Med. Journal*, May 9, 1857, *p.* 385.

26.—ON TRACHEOTOMY IN CROUP.

By Dr. C. T. Anjou, of Wadstena.

The operation of tracheotomy, which is attracting so much attention at the present day, and which is deservedly looked upon as the only means by which the last stage of croup can be successfully combated, is no new operation. In the latter half of the preceding century, it

was recommended by Home, who stated that he had recourse to it in threatened suffocation, the consequence of angina or croup; it soon, however, was allowed to fall into oblivion.

Bretonneau was the first (1835) who performed this operation with successful result in the last stage of croup, and he has, in a most valuable memoir, laid down rules to be observed in its performance, which are so accurate as to be still of value.

Trousseau, the pupil of Bretonneau, endeavoured to gain increased credit for the operation, by recording numerous cases in which it was successfully performed, and by various improvements and modifications which he effected in the details of the operation, and by honourable treatises and statistical data, which he compiled.

Velpeau, Guersant, and other distinguished surgeons, enriched the statistics of tracheotomy by many successful cases, and caused an increased confidence in the operation by their endeavours to render it as simple and as easy as possible.

There are many children in Paris who have been tracheotomised for croup, and who owe their lives to these able surgeons. The statistics of cases in that city give nearly thirty per cent. of cures.

Although this result is far from unfavourable, yet the operation has found opponents, especially in England, where the cases in which it has been performed are not such as to induce imitation. Trousseau accounts for this by the supposition that the operation has been too long postponed, that the adventitious membrane has extended too far, while at the same time the patient's strength has been brought too low. Dr. West, of London, is of the same opinion, and endeavours to make it appear probable that the disease presents different forms in the two countries. According to his opinion, in France the croupous process is chiefly limited to the upper part of the throat and trachea, while in England it extends more into the trachea and bronchial tubes; and, moreover, that combinations of a severe character are more frequent. Although different epidemics of croup may unquestionably possess peculiarities of this nature, yet this unproved hypothesis of West does not prove anything.

The cause of the untoward result appears to be partly that mentioned by Trousseau, and partly to arise from the addition of a less perfect and satisfactory mode of performing the operation.

In the 'London Medical Times,' March, 1853, Dr. Smith reports three cases of croup in which he operated: the result was fatal in all. He employed a piece of caoutchouc catheter, instead of the double canula, which we consider to be indispensable, and the result, therefore, is not such as to cause surprise.

In our own country the operation has also found gainsayers. One of our most distinguished writers, in a work on croup, thus expresses himself on the subject of tracheotomy:—"If the operation be looked upon as merely a palliative, then it is rational; but on this ground its general adoption cannot be recommended, for the advantages which it

affords are too small. But when the idea is entertained of thus effecting a radical cure, if, as Michaelis, we would seek the means of extracting the false membrane from the trachea, or as Bretonneau, would destroy it by a solution of alum, or light application of caustic, then the whole proceeding must be held to be nothing else than an absolute absurdity." Experience, however, has shown the reverse. The child in the agony of suffocation, struggling with death, is often restored to life; and it is certain that we have frequently prolonged, by the operation, the life of a child whom we had looked upon as lost. Usually at the moment after the operation, a perfect respiration takes place, and the danger of suffocation is gone, at least for a time. Such aid is not to be despised. The pseudo-membranous exudations in the larynx and trachea can then be attacked and removed, and the inflammation may subside. Thus the seat of the disease is better brought under observation, and the physician has a fairer field for carrying out the measures which circumstances may demand.

The operation is in itself easy of performance; various difficulties may afterwards arise, which require the utmost circumspection and patience on the part of the physician. It stands to reason, that the earlier the operation is undertaken—or in other words, the more limited the extent of the false membrane, and the less the strength of the patient has been reduced—the greater is the prospect of a favourable issue.

As it is difficult to determine accurately the extent of the croupous exudation into the air-tubes, the operation must be determined on under all circumstances where the fits of suffocation increase in severity, and the approach of asphyxia becomes more imminent.

Guersant lays particular stress upon the fact of the symptoms of suffocation being constant or transitory; in the latter case, when the fits of suffocation return after long intervals, he advises that the operation should not be determined on too quickly, but that we should be on our guard, and only resort to it in the utmost need. Admitting the value which these directions may possess, I again repeat, that the earlier the operation is performed, the more favourable is the prognosis.

It has been a subject of discussion, whether we should resort to tracheotomy or laryngo-tracheotomy; and they who favour the latter, do so on the grounds of the air-tube being here more superficial, consequently more easily reached; that we have to do with fewer veins; and that we do not run the risk of wounding the innominata or the left common carotid, which sometimes takes an irregular course and crosses the windpipe.

Trousseau prefers tracheotomy; he performed the operation more than one hundred times without having encountered anomalies of the vessels, and when we go to work cautiously, according to his method, we run no danger of injuring a large vessel, either artery or vein. He further supports his views by referring to the probability of necrosis of the cartilage, to the greater danger of injurious consequences to

the voice, from laryngo-tracheotomy, and finally, that in tracheotomy the windpipe is open at a point to which the false membrane may not as yet have reached, or where it has been latest formed, and thus a prospect exists, by suitable treatment of preventing the further extension of the evil.

With respect to anatomical details, it is to be remembered that in tracheotomy, the lower the point where the trachea is to be opened, the deeper it is; and that at the upper edge of the manubrium sterni, it is crossed by the left vena innominata, and that in croup the soft parts may be swollen and infiltrated with serum or air.

Dr. Anjou then describes the operation, and the instruments which are necessary, all which he states he has borrowed from one of the latest works of Trousseau on tracheotomy. He then says, the directions of Trousseau with regard to tying the veins I hold to be superfluous, if, indeed, they be not dangerous. On the one hand, the operation (which is frequently undertaken when it is of the last importance that not a moment of time should be lost) is thus delayed, and on the other a dangerous phlebitis may be occasioned.

If the operator has incautiously injured one of the larger thyroids or the brachio-cephalic vein, it may be necessary that it should be secured even to prevent danger to life, before the operation is finished.

The accidents which may arise during or after the operation, besides hemorrhage, are next briefly alluded to.

If asphyxia should supervene, and respiration cease altogether, then the operation is to be brought to a close as quickly as possible, and the dilator introduced. Cold water should be sprinkled on the face and epigastrium, and pressure made alternately on the chest and abdomen; air may also be blown into the trachea, which is best done by introducing an elastic catheter into the canula, or if that be not at hand the operator may apply his mouth to the wound, and so bring about respiration. This must be done with caution, to avoid rupturing air-vesicles, and thus causing emphysema. If blood flows into the windpipe, the patient must be laid with the head downwards. Sometimes at the close of the operation, syncope occurs, and at the moment when respiration is free, and the congestion suddenly removed from the brain; in this case also the face should be sprinkled with cold water; some drops may also be allowed to trickle into the trachea. A feather may be introduced to excite the respiratory muscles, or a sponge at the end of a piece of whalebone, to separate the membrane, and facilitate the expulsion of the blood and mucus. In general the respiration becomes very tranquil after the operation; if this be not the case it is to be feared that the false membrane extends beyond the opening, or that fragments of blood coagula or membrane block up the passage; then there is no expedient except to keep the wound open by the dilator, and if possible remove the obstruction. Blood coagula or pieces of membrane are often expelled by dropping water into the

trachea, by which cough is excited. Much more difficult is it to seize and draw out an adhering piece of membrane, which obstructs the trachea below the opening. Trousseau has, however, frequently succeeded with a small probang, a polypus forceps, &c., &c., in removing false membranes, which were thus fixed in the bronchi. Patience and perseverance are in all such cases essentially necessary. When the breathing becomes difficult, and there is reason to suppose that the obstacle is in the artificial passage, then the inner tube is to be removed and cleaned; this should be done every three hours, or oftener if necessary.

When, as frequently occurs, the wound, after some days, becomes covered with false membrane, it must be touched daily with caustic. The application of a caustic solution, by means of injection, to the larynx and trachea, was at first had recourse to in all cases of tracheotomy, but is now given up; there may, however, be cases in which the cautious application of caustic will be necessary, an example of which is afforded by the fourth case. Care must be taken that the air of the sick-chamber is pure, and that the temperature is moderate. A rule of great importance is, that after five or six days all drinks should be avoided, and the patient restricted as much as possible to solids. As it is of the utmost importance that the canula should be removed early, if the disease progresses favourably after five or six days, the opening of the canula should now and then be closed with the finger, to compel the air to pass through the larynx. After repeated trials the artificial opening may be closed for a longer time; until at length we may venture to remove the tube, and unite the edges of the wound with adhesive plaster. This should be done morning and evening, and after some days the wound will be perfectly healed.

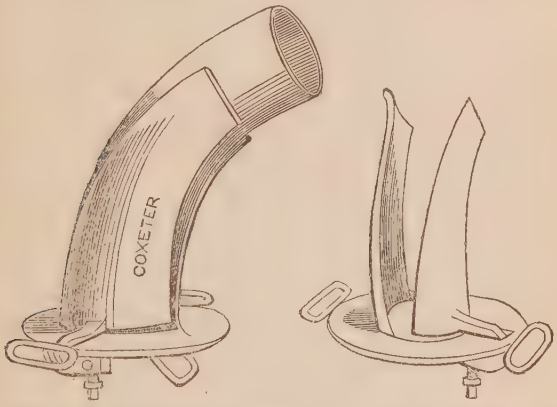
Dr. Anjou next gives a lengthened history of five cases.—*Dublin Hospital Gazette, July* 1, 1857, *p.* 203.

27.—ON DR. FULLER'S DILATING TRACHEA TUBE.

Subjoined is a representation of the trachea tube exhibited by Dr. Fuller at the Medico-Chirurgical Society on Tuesday, the 26th May. It was constructed by Coxeter, of Grafton Street East, at Dr. Fuller's suggestion, according to the directions given in his paper on Tracheotomy and Croup. It consists of two tubes, an inner and an outer one. The inner tube is longer than the outer one, somewhat flattened from side to side, of uniform diameter throughout, and so constructed at its internal or inferior extremity that the direction of its internal orifice shall be at right angles to that of its external orifice. The outer tube is divided vertically and longitudinally into two blades, which do not make up a perfect tube, but are merely the flattened lateral portions of a tube, the upper and lower portions of which have been cut away. These blades are fastened at their outer extremity by a hinge, which admits of their inner or inferior extremity being brought together in a wedge-like form, in the same manner as

the blades of a dilating bivalve speculum. When thus closed they can be introduced into the trachea through a very small incision, and then may be expanded without a moment's delay by merely pushing in the inner tube between them. A small screw is placed close to the joint, which by a few turns forms a stop, and effectually fixes them in their expanded position. As soon as they are thus fixed, the inner tube may be withdrawn, if necessary, for the purpose of cleansing, leaving the outer one in the position delineated in the second figure.

The peculiarities and advantages of Dr. Fuller's instrument over the tracheotomy tubes in common use are—



1st. *The uniformity of the diameter of the inner tube*.—This not only ensures uniformity in the force of the expiratory blast throughout the whole length of the tube, and thus renders obstruction far less probable, but it enables us to judge by the size of the outer orifice whether the calibre of the tube is capable of admitting a sufficient supply of air; a fact which it is impossible thus to ascertain when ordinary trachea tubes are used, inasmuch as they are tapered off, to a greater or less extent, according to the fancy of the surgeon or the instrument-maker.

2nd. *The direction of the internal orifice*.—This obviates all possibility of obstruction arising by the tube being pushed against the posterior wall of the trachea, an accident which may readily occur with many of the trachea tubes in common use.

3rd. *The construction of the outer tube*.—This not only facilitates the introduction of the tube through the edges of the incision, but renders serious obstruction well nigh impossible, inasmuch as should the inner tube become obstructed, its withdrawal would at once open a free channel for the admission of air through the expanded blades of the outer tube.—*Med. Times and Gazette, June* 13, 1857, *p.* 595.

DISEASES OF THE ORGANS OF DIGESTION.

28.—ON THE MANAGEMENT OF DIGESTION IN DISEASE.

By Dr. T. K. Chambers, Lecturer on the Practice of Medicine at St. Mary's Medical School, and Physician to the Hospital.

It is never too late to try and administer to the failing organ *the most potent of all medicines, the healthy human blood of the patient himself.*

The more I see of disease, the more convinced I become that the most important function for us to pay attention to in all cases is the digestion; in chronic cases it outweighs all the other functions put together. I am led to this conclusion not so much by physiological reasonings, or by the important position of this function in the great circle of life, as by observation of the effects of remedies, prescribed perhaps with quite different views, and often without any thought of the digestion at all. The effect of climate, for instance, in consumption is proportioned with extreme accuracy to the degree in which the absorption of food is improved or injured by it. I had a striking instance of this shown two months ago in the comparison of letters which I received at the same time about two young ladies that I had sent to pass the winter in a warmer climate. The elder of the two (S. S.—) was last year much the most advanced in disease; half of the right lung was rendered impervious to air and immovable by tubercle, local inflammations, hemorrhages, and pleural adhesions. She had also frequent dysmenorrhœa, and occasional menorrhagia. The younger (E. W—) had a small deposit of tubercle at the apex of the right lung, which excited cough, but no hæmoptysis or pleurisy. She was the stronger and most muscular of the two, and had least right to hereditary disposition, for her immediate family are alive, while S. S— has lost her mother by phthisis. Both had been under long courses of medicine by my direction, so I set them to begin the winter at any rate, and to go on as long as circumstances admitted, without any. What now is the result which I said struck me so forcibly? S. S—, the most diseased anatomically speaking, who had certainly the greatest amount of morbid tissue in her body, found the warm air assist her sluggish circulation, enable her to take exercise, improve the appetite, and add unwonted energy and spirits. No food was passed undigested, and the evacuation from the bowels was regular in time and quantity. The consequence of which condition of the assimilating organs, bowels and blood, has been a most decided amelioration of the pulmonary local symptoms, in spite of an intercurrent attack of hæmoptysis. There is scarce any pain, cough, or dyspnœa; she has increased in strength and weight, and boasts in her letter that she had one day ridden her pony five-and-twenty miles. E. W— had a tendency to a relaxed condition of bowels—not absolute diarrhœa, but the passage once or twice a day of unformed pultaceous stools, containing a large

quantity of undigested food. It was easy enough by medicines to prevent the motions being too frequent, but difficult to amend the assimilation of food. This diathesis seemed aggravated rather than improved in the mild climate; there was greater and greater inability to take exercise, then a return of pain and tenderness in the upper ribs, and at Christmas time the surgeon in attendance found a deposit of tubercle taking place at the apex of the left lung, in addition to what already existed in the right. Emaciation then commenced, and continuously progressed, quite unchecked by cod-liver oil and other expedients, which I thought it right should be tried, though without much expectation of success. In this patient my only hope is in a restoration of the digestive organs to a healthy state.

The remedy, the effect of which I thought was strikingly exemplified in this pair of cases accidentally reported together, is soft, warm air, in incipient consumption. The agreeable effects on the respiration, the relief of dyspnœa, the power of getting out in the open air, were equal in both, but how different has the result been!

These are not clinical lectures, so I will not systematically cite individual instances by name from those we have attended together, but a very moderate experience will soon enable you to class a dozen or more as resembling in their type one or the other of those above quoted. The atmosphere of our well-ventilated wards, and their even temperature in comparison with the depressing coldness and chilly damps of the streets whence our patients come, represents on a small scale what Torquay, Madeira, and Algiers are to the wealthy. And you may thus as students see what private practice will still more strongly impress upon you, that the effect of climate on digestion is the most important part of its action. The atmospheric change alone without medicine will benefit those who resemble the first class, more or less, in proportion to the extent of their disease, whilst the latter will usually grow worse in spite of drugs.

In all forms of dropsy, again, the effect which you desire to produce by remedies is strikingly dependent on the condition of the alimentary canal. Where the portal system is congested, I have given that strongest of drugs, elaterium, in doses gradually augmented up to three grains, without any of the vigorous hydragogue action naturally following; and then, by applying a few leeches to the anus, so as to disgorge the abdominal veins, half a grain has produced excessive purgation with reduction of the dropsy.

Amongst common diseases, another striking example of the dependence of the character of remedies upon their influence over the digestion is found in anæmia. If, as generally happens, iron can be got to improve the condition of the alimentary canal, so that the stools, from being scanty, scybalous, and mucous, consisting mainly of wind and semi-digested food, become natural and regular, then the body is renewed by fresh nutriment and the strength rapidly reinstated; but if it irritates the mucous membrane, so as to make the evacuation irre-

gular, black, and slimy, your patient remains as anæmic as ever. Hence the importance of suiting to the case the different forms in which the metal is prepared. If its rapid solubility and exposure to the absorbing surface, so as to get a large quantity quickly into the system were the only thing to be considered, the question of which is the best preparation might be left to the druggist. But it is not so; very often the easily-soluble salts so disturb the gastric mucous membrane that it refuses to pour out that secretion which is the chief solvent of albumen; the food passes unaltered into the intestines, and putrifying there, increases the disease. Whereas a sparingly soluble form of the medicament passes unaltered through the stomach, and exerts its main energy on the intestines. Again, some preparations, both soluble and insoluble, are more or less astringent, and have various qualities acting on various parts of the alimentary canal, which render them appropriate or not to individual cases.

It ought to be better understood that the fitness of any substance ingested, whether food or medicine, for its final destination, is not the only thing to be considered. Its capacity for entering into the circulation must be taken into account, and, above all, its dynamic influence over the organs of absorption and digestion. As a general rule, iron is the chief agent we think of in anæmia. We think of it for its direct power of increasing the hæmatin of the blood. Yet it is by no means always the first, or even the best, remedy when the blood-discs are deficient from faulty assimilation. I remember when I was a student noting down as a paradox that salts and senna acted as a tonic in three cases running, where iron and bark and bitters had done no good; yet that I could not find in any work a tonic action assigned to purgatives. I then saw that the use of medicines was not entirely according to their rating in our books.

The fact is, that until you have removed the sluggish state of the portal circulation, which does nothing but secrete mucus and obstruct absorption, you cannot get the protein compounds taken up, and they form a much more important constituent of blood globules than even iron.

And it is not only the general health that is benefited by attending to the functions of the stomach, but even organs as far as possible removed from it in a physiological point of view. A patient consults me from time to time who has an enlarged prostate. When digesting well, his urine is quite clear, and free from mucus, even when microscopically examined; but if the stomach is disturbed by any imprudence or accidental illness, there is a copious formation of pus in the bladder.

I shall return to this subject when I come to speak of medicine separately; now I mention it merely as an accessible instance to show you how all-important in treating chronic disease is the condition of the alimentary canal.

In acute disease, too, you will be almost equally disappointed with

the effects of your remedies, if you do not, either by their means, or by other means in addition to their administration, bring the alimentary canal into a proper state for their reception. In no cases is this more marked than in erysipelas and delirium tremens, and, therefore, you may have observed that I scarcely ever pass a bed in the wards containing a patient affected with one of these diseases without calling your attention to the fact. I point out to you that cinchona and wine are the proper remedies for the weak rapid pulse, the yellow pasty tongue, and the low inflammation of the skin in erysipelas; but that if you give these remedies without clearing away the saburral epithelium from the stomach and bowels, they are quite thrown away; the circulation continues as weak as ever, and the patient goes on advancing towards death. But if you have got a purgative to act, and are then in time with your alcoholic stimulants and bark, the corner is turned, and every change is towards health. I have often shown you, in the little ward where we put raving cases of delirium tremens, a man who has been taking large amounts of laudanum, morphia, and solid opium, yet is as rabid and demon-haunted as ever, his eyes never closing to the horrible visions that surround him. But on giving him an efficient dose of salts-and-senna by mouth or rectum, these powerful opiates become no longer requisite; he goes off into a quiet sleep, sometimes without any more, sometimes with an ordinary quantity of laudanum, and the next day he is usually calm enough to be removed to the common wards.

Now, do not misunderstand me, or suppose me to have turned "purgative-doctor," recommending an artificial diarrhœa as a panacea; on the contrary, I am anxious to warn you that there are acute cases where a purged state of the alimentary canal, natural or artificial, is most injurious. I would instance especially pneumonia and low fever. In the first, tartar emetic and cupping are beneficial just in proportion as the bowels are not purged; and if you give a cathartic, you very often destroy all the good effect of your remedies. In adynamic fevers, the prognosis may be almost entirely governed by the average proportion of solid matter to the liquid in the stools, and by the degree of digestion of food. Any expedients which increase the amount of solid and diminish the liquid intestinal evacuations, any which promote the taking up of nutriment by the mucous membrane, are doing good; any that act in a contrary way, do harm.

In pneumonia and low fevers, three-quarters of those who die, die of starvation. I mean that the real immediate cause of their death is the non-renewal of the blood by the supply of fresh matter. Both veins and arteries are filled with a dark, half-dead fluid, a great portion of which is incapable of fulfilling the functions of life at all. Expose this black blood to the air and it remains nearly as black as ever. No oxygen will redden it, for it is too dead to imbibe oxygen, and it is only fit to be evacuated. But, then, when it is evacuated, something must supply its place; new blood discs capable of living and absorbing

oxygen must be made, or the patient dies. Now, if you think only of getting rid of this dead matter by blood-letting and other evacuants, or if you think only of arresting the rapid destruction of the still living matter by alcohol, you are taking an imperfect view of your duties, and not doing all that may be done to rescue the patient. At the same time that you fulfil the other indications, it is your business to adopt expedients for promoting the supply of nutriment to the absorbents.

That is not to be accomplished by throwing in a large quantity at once, which decomposes and stops digestion before it can be digested. The alimentary canal either rejects or suffers from such treatment, and is all the more starved by the very abundance, like the Roman girl in Livy's legend, who was crushed to death by the stipulated rewards of her treachery.

The way to attain your object is to give a very small quantity at a time and very frequently, so that a continuous flow may be kept up through the alimentary canal without over-burdening it. The system of a patient laid up with acute disease is like that of a new-born infant, in the weak hold it has of life, and in the constant support it requires; and the stomachs of the two resemble one another in the insufficiency of the meal they can take at once to satisfy their wants for the time usual with adults. Treat them, therefore, in the same way; and as in proportion to its youth you order an infant to be fed frequently, so in proportion to their illness feed frequently your sick patients. A person prostrated by a fever, or by inflammation of an important vital organ, such as the lungs, for example, ought not to be more than two hours without food while awake, and I have not unfrequently administered it in doses of a few spoonfuls every hour, night and day, with decided advantage.

You may take a lesson, too, from the nursing of infants as respects the nature of the food: milk is the most perfect you can give. The only disadvantage is, that the caseine may be suddenly coagulated all at once in the stomach, and then, instead of passing on gradually, it has to remain there till enough gastric juice is secreted to dissolve it, and enough energy exist in the peristaltic muscles to move the mass onwards; till which time it stops the way. The better plan, therefore, is to mix sufficient lime-water with it, to prevent any large quantity of lactic acid being free; much of the milk will then pass the pylorus uncoagulated, or at any rate in very small coagula, and be digested by the intestinal juice, with no labour to the stomach.—

[Healthy digestion is characterized by being easy, quick, and complete, but the digestion of ill health is painful, slow, and defective.]

In the first stage of digestion we may notice, as common phenomena, those generally known by the following names:—Heartburn; Acidity; Weight; Tightness or distension; Oppression; Wearing or boring pain; Cramp or spasm; Eructations; Vomiting.

Heartburn.—A sensation as of extreme heat at the cardiac orifice of the stomach, running at intervals up the course of the œsophagus.

From the effects which alkalies have in relieving temporarily this discomfort, there seems no doubt that it arises from the action of the acid contents of the stomach on the cardiac and œsophageal nerves. *The gastric mucous membrane itself does not suffer from acids*; it secretes them, and bears them in contact for the remainder of the day without inconvenience. The gullet, too, will bear them *for a short time*, swallowing a mouthful of sour victuals or drink gives a healthy man no immediate inconvenience; but à *continued* exposure becomes painful in close proportion to its length, as may be easily tried by pouring down such articles slowly and continuously for a few minutes, whereby a pain will be produced even in the most healthy.

Heartburn, or pain from the action of acids on the cardiac end of the œsophageal plexus, may arise in three ways:—

1st. By over-sensitiveness of the nerves;

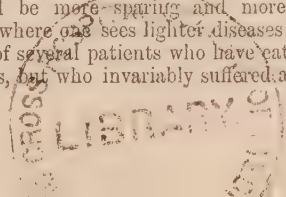
2nd. By too long exposure to the acids of digestion;

3rd. By too much acid being formed.

(1st) *By over-sensitiveness of these nerves* (=Over-feeling=Hyperæsthesis). This is sometimes, but not always, accompanied by over-sensitiveness in other parts of the body, and is the form of heart-burn which weak, nervous, hysterical persons suffer from. It comes on almost immediately after eating, directly the contents of the stomach have begun to assume that degree of acidity which is natural and necessary to them. If vomiting does not occur, it continues till they have become neutralized either by the saliva which usually flows abundantly down the œsophagus, or by taking some alkali, or by the moving on of the mass towards the pylorus.

The worst of this neutralization, natural or artificial, is, that a good deal of the albuminoid food remains undigested. It is absolutely requisite for its solution by the gastric juice that it should be acid while in the stomach; and if this natural acidity is prevented, because it happens to be painful to the over-sensitive nerves, the peptic solvent cannot act. Thus, the digestion, from being painful, is made defective also.

A peculiarity of heartburn from over-sensitiveness, which often is a great assistance to the diagnosis, is, that one kind of food brings it on as much as another; just in the same way as the peculiar grinding pain of gastric ulcer (which will be spoken of in a future lecture) is frequently to be distinguished by there being so little difference felt between various articles of diet. It is to be observed, also, that it is very often worse after the early than after the later meals, even though the dietary should be more sparing and more digestible. Indeed, in private practice, where one sees lighter diseases than those in the wards, I have notes of several patients who have eaten dinners and suppers without distress, but who invariably suffered after breakfast.



This form of heartburn usually occurs in nervous, sensitive persons, whether their state of system is congenital, or induced by external circumstances. Any morbid or extraordinary condition of the parts supplied by the abdominal plexuses of sympathetic nerves often brings it on. Tumours of the uterus or pregnancy are a very common cause, and excessive or painful menstruation often induce it in the female; and in the male, I have known it produced by piles and by mere constipation. It not unfrequently is accompanied by vomiting in persons who have a tendency thereto. And in these cases you have an opportunity of examining the contents of the stomach, and confirming what I stated about their being in a normal condition, by no means over acid or otherwise unnatural.

Over anxiety, watching, harrassing mental emotions, and in short, all external circumstances which bring on over sensitiveness in general, induces this state of digestion. Local pressure on the epigastrium will also often fix the disorder in that part. It is curious that while the ordinary nerves of feeling appear blunted by pressure and the frequent repetition of excitement, the sympathetic should be made in the same way more sensitive. Such, however, appears to be the case with the epigastric plexus, from the frequency with which this form of heartburn occurs in shoemakers, needlewomen, clerks, and others whose ordinary occupations involve pressure on the pit of the stomach.

As anæmia, debility, and occupations which occasion them induce this heartburn, so it, too, will react, and increase them, or even bring them on. An impoverished stomach, thus unable to bear the labour of digestion, becomes poorer still from defective supply. That happens in the human body which Martial complains of as one of the vices of civilization—those most in want gather least wealth—

"Dantur opes nulli nunc nisi divitibus."

But at the same time a slight change of habits, or slight relief from medicine, will equally react beneficially, and commence a march towards health with unexpected rapidity.

It will also, too, be sometimes associated with, and very much aggravate, the intermittent headache of marsh miasma, causing "brow-ague" to commence after the midday meal, instead of at other times.

The suddenness with which it will come on, and the rapidity with which it often goes away, is a great help to the diagnosis of the nervous origin of this heartburn, and is also a great encouragement to the physician to promise relief to the sufferer.

The sketch I have given of the physiology of this disorder points out the treatment most likely to be successful in the end. The aim must be, not to neutralize the acid, but to blunt the over-sensitiveness of the nerves. This can be done, first, *directly*, but temporarily, by medicines known, experimentally, to have that effect on sensitive nerves; secondly, *indirectly*, by strengthening the whole system, so that those nerves along with it may become hardier to bear the brunt of their necessary duties.

You have seen me, therefore, in the wards, begin the treatment with hydrocyanic acid and bismuth, and in a few days commence the use of steel or valerian or quinine. The benefit found from the first-named drugs is decided indeed, but it is temporary, and few cases will get permanently well without they are followed up by the tonics. At the same time, there is a great advantage, still greater in private than in hospital practice, in commencing with a medicine whose influence is immediate, and which will gain the confidence of your patient for any future plan you may adopt.

Where brow-ague, or any other form of neuralgia, is concomitant or consequent, you will best treat it by four or five grains of quinine, taken an hour and a half before the meal after which it comes on—that is to say, in most instances, the midday meal. I have found this treatment of the neuralgia more effective than iron, curing not only more certainly, but more rapidly.

Sponging the body with cold sea-water, and the shower-bath, are often most useful remedies, acting doubtless through the general system in a great measure. But cold sponging or douching the epigastrium, which may be easily managed sitting in a hip-bath, appears to have a special local action, and certainly does still more good.

The tonics which must follow up this special treatment may be varied according to the case and the patient's convenience; but, as a general rule, I find none do better than iron.

(2nd.) *By too long exposure to the acids of digestion.*—Many influences, which in moderation are rather pleasant than otherwise to the sensory nerves become exquisitely painful when long continued. For example, the immersion of a limb in water, a few degrees below the temperature of the air, is not disagreeable, and may be kept on with intermissions for any length of time; but becomes absolute torture if persisted in without an interval of rest. So, in many cases, a sluggish stomach, in which the progress of digestion is too slow, causes the cardiac orifice to be so long steeped with acid that it becomes painful, though a proper exposure for the natural length of time could be borne with ease. Just in the same way, a continued dribbling of fæces will make the anus sore—a continual running from the nose excoriate the nares.

This form of heartburn never, like the first, comes on immediately after eating. It often does not occur till four or more hours are passed; in fact, till the period at which the stomach ought to be nearly empty, and preparing for another meal. But the most usual time is an hour after food. Its long continuance will, however, be apt to induce that tenderness of nerves which constitutes the first form, so that it will approach nearer and nearer to the time of meals, till at last it commences immediately. It differs, though invariably, in one important diagnostic peculiarity, that it is more common after the later than the earlier meals. It will also, like the first form, bring on nervous headache, and occasionally a decided intermittent neuralgia, aggravated by

the same causes, and removable by the same remedies, as that arising from marsh miasma. Even if the meal should be omitted, this headache will still come on; but if the *time of the meal* be changed, the time of the headache will change with it.

Though the œsophagus is relaxed so as to admit of some regurgitation, yet what comes up is seldom more than air, usually of a neutral inoffensive character, and not in the great quantities and with the explosive force which marks the formation of carbonic acid by fermentation in the stomach.

The persons in whom it occurs are active men of business, literary labourers, clerks, over-thoughtful and over-careful. But when once acquired, it is very apt to persist in spite of a change in the mode of life. I have had as patients thus affected many farmers and country gentlemen who had suffered since youth, though living with little apparent care or intellectual occupation.

As before mentioned, it may lead to the first form of heartburn; but in symptoms, pathology, and treatment, it may be considered as a transition from it to the next in order. And I will, therefore, postpone speaking of the indications it affords till I have brought before you the heartburn which arises.

(3rdly.) *By too much acid being formed.* To this the name of "Acidity" is applied with propriety, because there really is an excess. It comes on at a period more distant from the time of meals than the last kind, and may be considered, in some respects, as a further stage of it. The pain, however, is much less intense in general, sometimes so slight as to cause scarce any inconvenience. But the regurgitations are much greater; sometimes true vomiting occurs, distinguished by spasmodic action of the diaphragm; sometimes only a teaspoonful of intensely sour liquid comes up, roughening the teeth, and bringing tears into the eyes; sometimes a gaseous acid (acetic and butyric) is belched up spasmodically; sometimes it oozes up gradually, and its presence is shown by the saliva and breath being sour to the taste and smell.

These peculiarities will suffice to distinguish between "acidity" or heartburn from real excess of acid, and those forms previously named where the excess is only apparent. A further test may be found in the action of remedies: a small dose of alkali, a grain or two of soda or potash, will be sufficient to appease them; whereas, in this case, a very considerable dose is required.

Acidity is often misunderstood. I have heard it spoken of as "an excess of gastric juice," "excess of action in the stomach"—that is to say, too much of a vital act, too much life. Such a mode of speaking, if it lead to anything, must lead to faulty thinking and bad treatment.

Instead of being an excess of gastric juice, it is itself a proof of deficiency. You may prove by experiments on artificial digestion, that an increase in the quantity of the solvent secretion quickens the

solution of albumen. You will find, for instance, that the amount of pepsin contained in twenty grains of Boudault's powders will dissolve a piece of hard-boiled white of egg much sooner than five grains. The same thing would of course happen in the stomach; were there more gastric juice there would be quicker digestion. But in "acidity", such is notoriously not the case; the aliments lie for a long time in the upper part of the digestive canal, and often are, after all, passed undissolved in the fæces. It is a chemical act of decomposition directly opposed to the vital act of digestion.

I call a "vital" act any which forms part of the great circle of life, such as is the conversion in the stomach of albumen incapable of solution and absorption into peptone capable of entering the circulation. Now, when this vital act of conversion is carried on with rapidity by a stomach making copious gastric juice strong in pepsin, then chemical decomposition is prevented.; nay, it is even arrested after it has commenced, as may be seen by putrid meat not becoming more but less putrid as it passes through the body of a healthy animal. But when the conversion is slowly or imperfectly performed, then chemical change has time to take place, and does so very soon, being favoured by the heat, moisture, and animal matter in a state of change. If the food remain too long without becoming chyme, the protein compounds putrify with extreme rapidity under such circumstances.

Compare this white of egg, which has been immersed in saliva at the temperature of 100° Fahr. for twenty hours, with another portion from the same egg kept the same time in distilled water. Your nose warns you of the difference directly; the first is intolerably fetid, the second quite sweet.

Exactly similar is the fate of undigested albumenoid matter, whether animal or vegetable, in contact with the mucous membranes inside the body. But how does that affect the case of acidity? Thus: I have in this beaker some syrup of grape sugar, quite neutral and natural. Here is some of the same which has been poured on a piece of putrifying albumen a few hours ago, and kept at the temperature of the body. You see that a piece of litmus paper I put in it is strongly reddened, showing the copious formation of lactic acid. In another beaker, the formation of butyric acid from fresh butter by the same means is shown to you.

Just so all the grape sugar and fat swallowed, when it meets in the stomach or intestines with decomposing animal food, remaining in a mass or glued to the side by a too-sticky mucus, ferments quickly throughout, and forms lactic and butyric acids in great quantity.

Remember, the grape sugar *swallowed* means something much more important than merely the grape sugar *eaten*. See this boiled starch; I heat some of it with the potassio-tartrate of copper, and there is no change in the blue colour of the salt. Now I put some in my mouth, and hold it less than a minute. See! when it is again heated with potassio-tartrate of copper, the metal is precipitated, and shows by its

brilliant yellow colour an abundant quantity of sugar. The saliva, you see, *begins* to convert starch into sugar *immediately;* very soon it will transform the whole mass. A mouthful of boiled starch which I held in my mouth for five minutes the other day, showed afterwards scarce a trace of starch remaining. As, even amongst meat-eating nations from half to five-sixths of the solid food consists of starch, it is evident that one of the most bulky contents of the stomach must be the sugar which has been made by the saliva out of amylaceous food. Here then is ample material for the formation of lactic acid to almost any amount. Add to this the oleaginous substances which it is impossible to avoid in any diet, and which, from being insoluble in water, constitute a peculiarly acrid and concentrated acid, and you will have no difficulty in accounting for acidity, without recurring to a theoretical excess of gastric juice. Acidity then is an evidence of chemical, and therefore of decreased, vital action, a proof of incomplete digestion, of deficient activity in the stomach.

On this rests the *rationale* of the hints for treatment which it gives. The way to cure it *temporarily* is to neutralize by alkalies the excess of acid which is formed. And this may be freely done without fear of bad consequences; for you are not likely by any reasonable dose to make it so far alkaline as to interfere with digestion. It is not in this form, where acid is really in excess, but in the first (or nervous) heartburn that alkalies do harm, for the reasons there stated. Where it arises simply from the temporary debility induced by occasional gluttony, "the remorse of a guilty stomach," it may be left to cure itself. But a *permanent* cure can only be brought about by re-agents which—

1st. Strengthen the local power of the gastric solvent;

2nd. Augment its quantity;

3rd. Excite the peristaltic motions.

The local power of the pepsin secreted, although in diminished quantity, may be much increased by neutralizing the saliva swallowed and collected in the stomach and œsophagus just before the meal. In laboratory experiments on artificial digestion, you will find that saliva arrests the solvent action of pepsin in a close proportion to its amount. In the laboratory you may set the action at work again by acidifying the mixture, unless you have waited so long as to allow it to decom- So, too, in the stomach, if you take it in time, you may free the pepsin from the alkaline saliva, and enable it to do its duty by adding acids. The best to select are those to which the viscera are most used, hydrochloric or lactic. A few drops of these taken immediately before meals will almost always have a beneficial effect.

The quantity of the gastric juice may be increased by supplying one of its most important constituents, water; but in large quantity at the meal it is apt to dilute too much the sparing secretion, and hence it is better to direct the principal draughts to be taken half an hour afterwards. An artificial gastric juice, in the shape of one of the new

preparations of pepsin, may also be given if the acids are not sufficient; but I prefer to try at first and make the patient his own secretor. The colder the water the better; for the low temperature acts as a tonic shower-bath to the local nerves, and removes the congestion of the blood-vessels, while at the same time it never quite stops digestion, and soon acquires heat enough to let it go on with full rapidity.

Your patient will perhaps think that you are blowing hot and cold, or rendering inert your own treatment, by ordering acids at one time and alkalies at another; so you will find it a wise plan to give him a little physiological lecture on the subject, explaining the reason of your conduct. You may explain also that the acids given as medicine do something more than in the laboratory: they stimulate the mucous membrane, and so actually increase the quantity of secretion while they increase its power. You need not have the fear, which I have heard some express, that the use of these substitutes for the natural constituents of the gastric juice, or rather the supply of that which ought to exist in the gastric juice, will make the stomach lazy—as doing a servant's work for him makes him less equal to doing it himself. On the contrary, the new vigour put into the system by the healthier and more copious chyme that is formed, makes the organ more active; so that it soon is enabled to go on secreting itself what is wanted, and to do without the artificial substitute. Do not, therefore, let patients fancy that they shall get into a habit of taking medicines, so as to be obliged to continue or to increase the dose. If they derive benefit therefrom, they will be able soon to leave them off.

The action of the peristaltic muscles of the stomach can be excited by most of the drugs which act as purgatives. But unfortunately, in the great majority of gastric complaints, purgatives are decidedly injurious, so that the good done to the stomach is overbalanced by the injury done elsewhere. The least hurtful are rhubarb and aloes; but even they somewhat impede the digestion in many persons who take them as a dinner pill. A better expedient is strychnine. Its small bulk causes it to be quickly absorbed, and to act locally on the stomach alone without affecting the rest of the system; so that where common caution is observed, I have never known it obliged to be left off on account of its specific spasmodic effects; at the same time its beneficial influence is most marked, and in many instances it acts as a bitter tonic also, increasing the appetite and spirits.—*Lancet, June* 13, *and July* 11, 1857, *pp.* 597, 25.

29.—ON ERUCTATION AND VOMITING.

By Dr. T. K. Chambers, Physician to St. Mary's Hospital.

[The morbid states of which eructation is a phenomenon naturally divide themselves into three groups. 1. Where there is simply a relaxed œsophagus. 2. Where there is an increased quantity of atmo-

spheric air swallowed; and 3. Where foreign gases are swallowed from chemical decomposition.]

The indications of treatment afforded by eructation, are different in the three groups of cases in which it occurs. In the *first*, antacids are often sufficient for temporary relief. Four grains of rhubarb-pill, with a grain of gallic acid, taken before dinner, is still more useful, for the tone thus given to the mucous membrane prevents the recurrence of the inconvenience. In more severe cases I have found a rhubarb draught with gallic acid, taken three times a day, a very efficient remedy.

In the *second* group, where excess of air is swallowed, valerian and ammonia are very beneficial. Where there is nausea or vomiting, the valerianate of zinc may take their place; but it is not so certain as the infusion or tincture of the herb. Where this fails, use strychnine, which you have seen in the wards to be the most powerful agent we have to steady irregular nervous action, as hysteria, chorea, &c.

In the *third* group, the great object must be to prevent decomposition. In the laboratory you find that no agent is so powerful in this respect as sulphurous acid; and, accordingly, it is much used in various processes of the arts for the purpose. Sulphur is often burnt in casks to arrest the fermentation which is apt to be going on in the liquids soaked up by the cracks or porous parts of the wood, and the sulphurous acid vapours effectually do their duty. The Board of Health, so well represented in this parish by my accomplished colleague, Dr. Sanderson, finds no disinfectant for fetid sewers so instantaneous in its action as Macdougal's, the chief ingredient in which is sulphite of lime. Meat may be prepared on the same principle, and keeps as well as when salted or dried; and you may test, even on such a delicate substance as yelk of egg how fresh it keeps with any sulphite salt. The same effect is produced by taking as a medicine hyposulphite of soda; the fermentation of the contents of the stomach is arrested, and the evil effects of that fermentation prevented.

Another powerful arrester of chemical change is charcoal. When soup has begun to turn sour in hot weather, clever cooks boil it again with a little bag of charcoal in it, and it becomes quite sweet. The same agent will prevent decomposition in the alimentary crnal. I have used it, I must say, only in cases where the decomposition occurs in the intestines, producing flatulence; but I should not hesitate to employ it in gastric fermentation also, if hyposulphite of soda chanced to disagree or was not beneficial.

Vomiting seems less than any of the phenomena previously discussed dependent upon the peculiar condition of the stomach, and more upon the idiosyncrasy of the individual. There are those who, whatever may be the matter with them, never vomit; whilst others do so on the slightest occasion. Even pleasant associations will, in some people, bring on this most unpleasant consequence: a patient of mine, a healthy young lady, is frequently seized with retching on entering a

ball-room where she expects an agreeable evening; whilst it never happens in going to a stupid party. On the other hand, I have had patients with cancer of the stomach, and others with various sorts of severe dyspepsia, who could take the most nauseating drugs without inconvenience. The mere fact of vomiting, therefore, affords in itself no clue to the local condition of the stomach. But the time of its occurrence, the circumstances which increase it, and the nature of the matters thrown up, may be most suggestive to the practitioner.

Vomiting which occurs when the stomach is empty, or which, though it occurs at other times, is most frequent and distressing then, may be safely set down as arising not from any fault of the viscera itself. Such is the morning vomiting frequent in pregnant women, in cases of diseased heart, of abdominal tumour, and sometimes of pulmonary consumption. This is no doubt a reflex action of the vagus nerve excited by the irregular irritation of some of its branches; and on the same principle I can easily understand the more rare cases where vomiting has been caused by foreign bodies in the ear or nose, by tumours in the neck, &c.

When vomiting occurs with a replenished stomach, it may be considered as a general rule that the smaller the quantity of food which produces it, and the sooner it takes place after eating, the nearer to the mouth is the seat of injury. Disease of the œsophagus causes rejection of the food before it has got down; of the cardia, or smaller curvature, very soon after it has got down; and disease of the pylorus, or pancreas, or liver, after an interval sometimes of as much as several hours.

When vomiting arises from congestion of the brain, as in apoplexy, drowning, concussion, or in dead drunkenness, it is increased by the horizontal posture; when it arises from deficient supply of blood, as in fainting, anæmia, and sea-sickness, that position relieves it.

The contents of the vomit, which can afford practical suggestions to the practitioner, are the following:—

Mucus, if it is in large stringy masses, shows a generally diffused morbid condition of the stomach itself; if it is in small round lumps, it has most probably been secreted from the bronchi and swallowed.

Blood, when it comes from an open vessel perforated by an ulcer, always is in considerable quantities, and contains black clots; if it is mixed up with mucus, brown and shreddy, it denotes a high state of congestion of the gastric walls, rupturing some small capillaries, or what is commonly called exudation.

Saliva, readily distinguished by its alkalinity, and the abundance of buccal epithelium contained in it; when in large quantities, it denotes an irritable state of œsophagus and fauces; when it constitutes the bulk of the vomit of pregnant women, you will often find associated with it a sort of salivation in the mouth.

Fæces or fæculent smell. This is usually referred to a *reversal* of the peristaltic motion; but I do not think it necessary to resort to such

a strained explanation. When we reflect that about twelve quarts of secretion is daily poured into the intestines, it is easy to see that you have only to stop the onward peristaltic wave and absorption, for the ilia to get overfilled, and for their contents to overflow upwards into the stomach. There they naturally produce vomiting, just as they would if swallowed. Such a paralysis of muscles and absorbents takes place in peritonitis, as well as in mechanical obstruction of the ilia, and consequently in peritonitis you have sometimes fæculent vomiting.

Fermenting matters in the vomit show the continous retention in the stomach of some remains of the food or of vegetable growths in a constant state of chemical change. There is therefore present a quantity of adherent mucus capable of retaining them there.

Acid matters in excessive amount may arise from a similar state of things; but it appears as if simple torpidity of stomach, without necessarily the presence of mucus, can occasion it.

Pure unchanged food shows that the vomiting arises from the state of the nervous system, which is either *locally* irritable, from neighbouring anatomical changes; or *secondarily*, as in pregnancy; or *generally*, as in hysteria.

The remedial measures which I have found most useful in cases of vomiting are the following:—

Hydrocyanic acid, where it arises not from any fault of the stomach itself, but from the secondary condition of the nervous system, as in pregnancy, diseased heart, in abdominal tumour, in pulmonary consumption, in peritonitis.

Carbonate of magnesia, in the vomiting accompanying gastric mucous flux, with copious formation of acid.

Opium, in acute vomiting from gastric ulcer, from malignant tumour, in fæcal vomiting from perforation, peritonitis, internal hernia—in short, wherever the vomiting is accompanied by much local pain.

Chloroform, in the vomiting at the commencement of fevers. It may be applied either on a cloth to the epigastrium, especially in choleraic vomiting, or taken by the mouth.

Leeches.—Very often the vomiting in cases of gastric ulcer will not be appeased till some leeches have been applied to the epigastrium.

Milk and lime-water, as a sole diet, will often alone stop chronic vomiting. Complete rest and absence from excitement must accompany it.

Brandy, in teaspoonful doses, is a favourite domestic remedy. It is suitable in acute cases for the nonce, and will often stop nervous vomiting from mental causes, but is obviously not adapted for chronic disease.

Creosote.—This is a whimsical remedy, and I confess I cannot at all satisfy myself what cases it is suited to. The vomiting certainly seems checked by it sometimes, sometimes is aggravated, more commonly is uninfluenced. The cases where it has done good have appeared to me generally dependent on nervous causes. For example, it has been beneficial in hysterical vomiting.

Valerianate of zinc I tried once, in hysterical vomiting, with good effect. But in these patients the most powerful remedy is the *shower bath.*

Ice is often most useful in acute vomiting in fevers, in chronic cases of gastric ulcer, and in all cases is an agreeable remedy in warm weather.

The administration of food in cases of chronic vomiting is a matter of much importance. You must not let your patient be starved. Even when milk and lime-water does not check the vomiting, it is by far the best diet. In teaspoonfuls at a time, it can almost always be kept down.

You must not suppose the being starved to death from vomiting an hypothetical fear. A young woman came under my care a few months ago who had been deserted by her lover. She had had violent hysterical fits, and an utter inability to keep anything on her stomach for some days: the pulse was failing, and the tongue getting dry and brown. An attempt was made to retain life by means of nutritive enemata, but in vain. At the post-mortem examination every organ was in a completely normal state, and the catamenia were flowing from the uterus. Clearly she had died of starvation only.

When sea-sickness goes to the extent of making a person seriously ill, it is worth while to stop it or prevent it, as you can generally do by a large dose of opium. But it is very far from being worth while for healthy persons, or even invalids, in ordinary cases, to take this preventive: for a small dose is useless, and the requisite large one makes the patient endure much more discomfort afterwards than the sickness during the voyage would have caused. Chloroform does not arrest the nausea, but it certainly does seem to control the violence of the straining. The best remedy for healthy persons to take is very frothy bottled porter: if it does not in every case prevent the vomiting, yet the prostration afterwards is certainly avoided, and the ejecta are not so disagreeable.—*Lancet, August* 8, 1857, *p.* 132.

30.—ON DIARRHŒA.

By Dr. T. K. Chambers, Physician to St. Mary's Hospital.

[The two great functions of mucous membranes are absorption and secretion; the latter is of most importance in the stomach, the former in the small intestines. When absorption is deficient in the small intestines we have a true diarrhœa which must be distinguished from mere frequency of evacuation or tenesmus, which arises from abnormal state of the colon or rectum, and it is possible that even less than the average quantity of fæces may be passed.]

The prevailing contents of the stools constitute the best principle of division; and according to it we may speak without being misunderstood of Bilious, Watery, Muco-purulent, Bloody, and Putrid diarrhœa.

Bilious diarrhœa is the simplest form of the disorder. Bile, normally poured out by the liver to the extent of from three to four pints a day, merely requires not to be concentrated by the intestinal absorption, to add very largely to the excrements. Its presence is declared in them by its well-known smell, and by a colour exhibiting various shades of yellow, brown, and olive-green, according to its absorption of oxygen, and mixture with fæces.

This arrest of the absorbing power of the intestines and consequent rejection of bile mixed at first with fæces, and when the bowels are emptied, augmented by the exudation of water from their parietes, is what so often takes place temporarily from the impression of cold, from irritation of the alimentary canal by unwholesome food, and from mental emotion. It is possible also that the qualities of the bile itself may be altered in some cases, or its quantity increased. It may be changed by medicines, as by calomel or by senna, and so rendered incapable of absorption, and be poured through the ilia without their being in fault. Congestion of the portal system, such as is especially frequent in Europeans resident in warm climates, causes the bile to be at one time deficient, and afterwards to be poured out in excess. Irritation of the stomach and duodenum causes it to be retained in the liver and gall-bladder till it is unfit for absorption. In both these cases it is rejected by the bowels and constitutes Bilious diarrhœa.

You must be very careful to distinguish this symptom from a different one, often confounded with it—viz., the presence of a bright, grass-green matter in the stools. This is not bile at all, but in reality, altered blood, and denotes congestive inflammation of the mucous membrane, of course requiring very opposite treatment. Your best aids to diagnosis are, first, *the Smell*: in real bilious stools, the odour of the hepatic secretion can always be perceived, in spite of the fæces mixed with it; and at the same time it always prevents putrescence, or even counteracts the incipient putrescence of undigested aliments; while in the grass-green stools the smell is not of bile, but more or less cadaverous or putrid. Secondly, the microscope exhibits in the mucus, which always is present, the usual globules of mucus and pus, with small shreds of fibrine and blood globules.

In *Watery* diarrhœa it is probable that there is increased exhalation of aqueous fluid from the blood-vessels of the intestines as well as an arrest of its absorption. In this form, when pure, if the fæces are retained by a voluntary effort, they may be concentrated nearly to their normal condition by the removal of the water, and thus a test afforded that their state depends merely on the addition of this constituent. Thus, for instance, if you take a saline purgative, you may feel several pints of fluid rolling about in the bowels; but if you resist the inclination to stool, it goes off at last, and you void afterwards little more than the ordinary amount of semi-solid fæces. It is not so in bilious or other diarrhœas, except the watery.

Watery diarrhœa, when not arising from the anti-osmotic action of

neutral salts, indicates a congested state of the venous plexus of the of the alimentary canal, and a consequent morbid proneness to exhalation and deficiency in absorption. The vitality of the mucous membrane is deficient, as is shown in cholera and low fever; and if not restored, local death, exhibited in ulcers and sloughs, must be the result.

The exhalation, however, tends to become habitual, and so continues beyond the period of congestion, so that the whole mass of blood is relieved of its water, and thus dropsical swellings may be re-absorbed and passed off through the bowels.

In *Muco-purulent* diarrhœa, water is in excess, but the characteristic is the presence of mucus or pus mixed with it; in which also there are, in acute cases, shreds of fibrine, blood-globules, and flakes of the peculiar epithelium of the bowels.

Should any of these products of inflammation be alone, separate and unmixed with the fæces, then it is probable they come from the colon or rectum; but if they are mixed up with a large quantity of watery fluid, and still more, if that watery fluid shows itself to be the serum of the blood by coagulating with heat, then there is little doubt of their source being the mucous membrane of the ilia, whose morbid condition it consequently indicates. The fluid in muco-purulent diarrhœa is always highly alkaline, and if examined with the microscope, crystals of ammonio-magnesian phosphate are found scattered through it. If allowed to stand, it separates into two distinct parts: the one *serous*, varying in colour from complete whiteness and transparency through all the shades of yellow to deep brown, or, where blood is present, to red and black, in which are the flakes of fibrine, the ammoniacal crystals and floating globules; the other, *sedimentary*, consisting principally of grey, granular matter, the débris of food and more or less colouring matter of the bile and semi-digested blood.

The degree of serosity and the proportion of the products of inflammation in the first, show the extent to which inflammation has gone in the mucous membrane. Whiteness, bloodiness, putridity, alkalinity, being bad signs; yellowness, opacity, the smell of bile, and the absence of putridity, being good.

The second, or sedimentary, portion proves the condition of the general system rather than that of the ilia in particular. If it is copious in proportion to the fluid, then the normal function of destructive assimilation is shown to be little interfered with: if it is scanty, this important process is arrested, the effete morbid tissues are not being removed from the body, and a more grave state of affairs exists. The quantity of solid sedimentary matter is the best test you can have of an advance towards health, or departure therefrom, in all cases where there is this state of bowels.

The most common examples of muco-purulent diarrhœa are found amongst acute diseases, in low fever, in cholera, enteritis, and dysentery, especially in the teething dysentery of children. Amongst chro-

nic diseases, ulceration of the bowels, whether a consequence of phthisis or low fever, is the most usual cause.

Bloody diarrhœa, where the blood is in small streaks in the mucus, or slightly mixed with the serum, or mixed with the grass-green mucus above described, indicates an inflammatory state. When it is in clots, either black or fibrinous, with the globules partially washed away, it shows that a blood-vessel of notable size has been opened into, probably by ulceration. Should pus be mixed with it, the diagnosis of ulceration is confirmed. Black, semi-digested blood, precipitated by standing with the sediment of fluid stools, comes from high up in the alimentary canal, as it indicates its exposure to the gastric juice. It not unfrequently comes from the stomach itself.

Putridity of the stools in diarrhœa always shows that there is an imperfect quantity of bile in them, one of the most clearly-ascertained functions of that secretion being to prevent the chemical decomposition of albuminous matters. This may arise from two sources—namely, the food taken, or the albuminous secretions into the alimentary canal. A close examination of the stools will generally distinguish them. If it is non-digested food which is decaying, then the solid constituents of the fæces are bulky, pale, containing large lumps of still paler substance visible to the naked eye. And if these are examined by the microscope, they will be found to consist of muscular fibre, fat, and other parts of victuals, often swarming with live infusoria and fibriones. This occurs from time to time in all cases of deranged digestion. If the fœtor arises from the albumen of the exhaled serum, it will be observed to be situated in the most fluid part of the motions, which are like the washings of macerated flesh, while the solid part is scanty and comparatively unaffected. This shows a much more serious state of the vital powers, and in severe complaints, such as low fever, is usually the harbinger of death. It is often joined to a peculiar mouse-like smell in the sweat.

In some instances of mucous flux and indigestion in the upper part of the alimentary canal, the stools are acid from time to time. There is nothing special in the pathology of this. It arises simply from so much acid being formed from the decomposition of food, that it cannot be neutralized by the alkaline juices. Sometimes the acidification takes place in the stomach, sometimes in the cæcum, during the delay of the decomposing aliments there. In the latter case considerable pain is often experienced in the right iliac region, and in the course of the colon just before the evacuations.

In all forms of diarrhœa from affections of the small intestines the evil is twofold: first, the aliment, which ought to contribute to the support of the system, is hurried through the abdomen, and so the supplies are cut off; and, secondly, destruction is carried on at an increased rate by exhalation from the mucous membrane of the bowels. The stick is being cut away at both ends, and hence there is nothing which produces such rapid emaciation. Where *soi-disant* "diarrhœa" is

reported to you as existing for any length of time without emaciation, always let your suspicions be aroused; observe carefully whether the quantity of excrement really is in excess, or whether the ailment is not rather of the nature of tenesmus, and arising from the colon or rectum. You will generally find such to be the fact, and must vary your treatment accordingly.

Sometimes diarrhœa seems to be the transference of a tendency to exudation of serum from another tissue to the alimentary canal. Such is that which sometimes comes on of its own accord, or may be artificially induced in ascites, and which certainly diminishes the effusion. Such is the diarrhœa of uræmia, which, however, does not usually relieve the anasarca, but rather increases it from the weakening of the blood which follows. Hence it is a very bad, almost a fatal, symptom in the latter disease.

The most important indication of treatment is connected with the diet. It must be such as does not require a perfect state of the digestive organs for its absorption, while, at the same time, it is nutritive to the patient. The most complete is milk and lime water. In feverish cases it may be iced, and soda water may be occasionally substituted for the lime. Keeping a person solely on this diet is often sufficient alone to cure all sorts of diarrhœa not dependent on a permanent chronic cause; and even where there is such a cause for it, very great temporary benefit is derived, which forms a better starting point for medicinal treatment than the previous state.

In a temporary diarrhœa without other disease the loss of the normal supply to the body is not of so much consequence, a short starvation, perhaps, does good to a person otherwise healthy. But in severe acute disease, or in long-continued chronic diarrhœa, this is an important consideration, and care must be taken to allow for it. Since food in the usual quantities at once cannot be borne, and is rejected undigested, give it very frequently and in small portions. The alkaline milk diet I have just recommended allows this to be done most conveniently. A jug of the liquid may be kept close at hand, and drunk from time to time, so that as much nutriment may be taken in the twenty-four hours as would be done by a healthy person without the alimentary canal ever being overloaded.

When there are lumps of feculent matter in the stools, and a smell like that of normal excrement, give purgatives. Until you get rid of these remains of previous constipation, you will be sure to have a relapse of diarrhœa, though your medicines may check it for a time. When there is no normal smell present, I have never found purgatives beneficial. This is a better rule than the routine practice of always commencing the treatment with a purgative—a plan which I have known very injurious in cases of chronic diarrhœa.

Where the products of acute inflammation are found mixed in the stools, such as white and opaque mucus, flakes of fibrine, epithelium, blood-streaked mucus, bright-green matter, &c., as above described,

leeches, fomentations, warm hip-baths, and poultices to the abdomen, are the appropriate treatment, and should not be delayed. In the case of babies, the whole abdomen and loins may be fastened up in a large circumambient poultice, which they cannot wriggle away from, one or two leeches put on near the navel, and the bites allowed to bleed for some time. The drugs I would have most trust in are calomel, ipecacuanha, and carbonate of soda. Of the first and second equal quantities, and a double quantity of the third, may be made into powders, of which from four to six grains, according to the child's age, may be given every three hours.

Be very careful in infants to look to the teeth. The state of bowels may very likely be dependent on reflex irritation from the dental nerves. Lancing the gums will sometimes stop a most violent diarrhœa where the stools show evident proof of the inflammatory condition of the ilia. In teething infants, too, opium is of striking utility. I begin with half a grain of Dover's powders every three hours, increasing the dose by half a grain every three doses, till a decided excess of *sleepiness is produced by it.*

In low fever the presence of diarrhœa indicates to me the employment of mercury in the form of *mercury with chalk.* The effect of this drug is the increase of solid sedimentary matter in the stools; in other words, a restoration of the destructive assimilation going on in the body. The motions are diminished in number and in fluidity, but not in actual quantity. Thus the tissues devitalized by the typhoid poison are removed, and can be replaced by new nutriment. I am used to take this increase of solid matter as an evidence and test of benefit accruing from the use of mercury, and as a prognosis of good.

Where in the absence of fever blood is passed by the bowels, the two most powerful means of checking it I have found to be turpentine and acetate of lead, especially the latter. Its direct influence as a poison on the bowels would have led to expecting this. If the hemorrhage has gone on for some time, I am inclined to think it must be sometimes due to a clot distending the bowel, and preventing it contracting upon the bleeding spot, for certainly a dose of castor oil, in the results of which a quantity of pale clots were exhibited, has several times in my experience stopped hemorrhage from the bowels.

The long continuance of diarrhœa from ulceration of the ilia must starve the patient. It tends also to prolong itself; for the weaker the system is, the more irritable are the sore places, and the less can the morbid actions they set up be resisted. It is right, therefore, to use direct means for arresting it. The best are such as blunt the sensibility of the ulcerated spots. The milk-and-lime-water diet should be used first, then chalk and opium, which appear to act on the sore mucous membrane just as they do on a raw blistered surface of skin. If these fail, sulphate of copper should be used in doses increased from a quarter of a grain up to two grains. If no good accrues after this, I suspect an error has been made in the diagnosis.

Where there is a simple flux of transparent mucus without fever, pain, or pressure, or any fibrine or blood in the motions, the vegetable astringents, such as logwood, bark, kino, and tannin, are often of great use. In such cases, too, I have prescribed iron with seeming benefit. I must, however, say, that I feel doubtful whether this form of flux is not rather due to the colon than to the small intestines, in the great majority of instances.

Where the solid matter is copious, pale, and fetid, consisting mainly of undigested food, inspissated bile may be given with benefit; the stools become darker, less fetid, and less frequent under its employment. This is particularly the case in children whose mesenteric glands are diseased. I am hopeful, too, that pepsine will prove a still more efficient remedy in the same cases, as it certainly diminishes the fetor of the motions in the best way—namely, by promoting the normal solution of the food.

Acid diarrhœa indicates the free employment of chalk.

The use of opiates in diarrhœa must never be made a matter of routine. As a general rule, I have found them beneficial without consequent harm, in cases where there was tenesmus and frequent stools; but where the fæces are bulky and copious they appear to impede the natural secretion. Where the stools also are putrid, caution is required in their use. In the diarrhœa which so often accompanies and proves fatal in uræmia, they check, indeed, the debilitating flux, but they are apt to bring on coma.

In some cases of diarrhœa from chronic mucous flux of the intestines, without ulceration or acute inflammation, I have found riding exercise very beneficial. I suppose it is the gentle agitation of the the abdomen, combined with the air and amusement, that proves of use.

In recommending the recreation of travelling to invalids subject to diarrhœa, you must be very careful where you send them to. The epidemic influence of cholera which has overspread Europe during the present generation, visiting almost every square mile of it several times during the last few years, has in many places left behind it a chronic endemic poison. The natives are, indeed, insensible to it, but few strangers escape becoming affected more or less, according to their idiosyncrasies. Strong persons find it only an inconvenience, but an invalid is put in some danger, and certainly loses all the advantage of the tour. This is especially the case in the mountainous districts of the South of France, the Pyrenees, and Dauphiny, and in the volcanic regions bordering the Rhine, the Eifel and Moselle country, as well as those in the centre of France, the ancient province of Auvergne. All these places are attractive from their picturesque beauties, and therefore it is necessary that you should be warned of this evil attendant upon choosing them as the scene of a tour. You will see sometimes the whole number of strangers at a table d'hôte obliged to leave the room at once, and cause one another no slight inconvenience by tend-

ing all together in the same direction; and in the Pyrenees I have seen powders of chalk-and-opium put up as the regular concomitants of a day's walk. It must not be supposed that this is the result of the foreign modes of cooking. I have known English biscuits and porter, and boiled eggs, adopted as a diet without relief, though of course nothing foreign could have got into them. I believe the cause to be that which I at first represented it—namely, a poison left endemic since the passage of cholera through the country, but to which the natives have become acclimatised. That it is of late years only that it has been prevalent is shown both by local report and the omission of all mention of it from the work on "Climate," by Sir James Clark.

One source from which strangers contract this diarrhœa, is an evil capable of, and rightly demanding, amendment: I refer to the filthy privies in continental inns. A gentleman, eminent in his profession and of good judgment, told me that, during a Pyrenean tour lately, he entirely escaped the diarrhœa which everybody else without exception suffered from, by adhering to a strict rule of never entering one of these disgusting holes, but worshipping Cloacina under the pure light of the stars. Invalids and ladies cannot so well manage this, unless they are rich enough to travel with carriages and servants and peripatetic waterclosets.

Flatus in the small intestines is one of the most troublesome forms of wind. If it escape into the stomach, which is fortunately rare, the taste and smell are peculiarly nauseous, whilst it seems to have considerable difficulty in passing the ilio-cæcal valve. Hence it rolls about in the abdomen from the changes in position which the motion outwards of the alimentary masses involve, and causes the well known and distressing "borborygmi," till it can get absorbed. The abdomen will often be distended for several days with it, without its being able to escape.

The persons most liable to this troublesome affection are anæmic and hysterical women; it follows also the small and contracted liver of spirit-drinkers, and sometimes is very annoying in cases of dilated heart. Some persons, also, in apparent health are habitually much troubled with it. I am inclined to attribute it under these circumstances to a naturally sluggish portal circulation, which does not so quickly absorb the contained air as a freer motion in the bloodvessels would enable it to do.

Flatus in the intestines is troublesome during the day, from the tumidity of the abdomen, and noise on motion, and pain in the side; but when it comes at night it causes still more inconvenience by preventing sleep. I cannot explain why this is; there is not enough pain or discomfort to account for it, yet a complete wakefulness and apparent want of desire for sleep commonly prevails. It is to be remarked, also, that it is in most instances made worse by opiates. Sometimes the patient will go to sleep easily and naturally on first lying down,

and will then wake up in an hour or two, finding his abdomen tumid and uncomfortable, and will remain entirely without rest for the remainder of the night; or if he drop off for a few minutes into unconsciousness, it seems rather to aggravate than relieve the feverish restlessness, and to cause headache.

The most effectual remedy is finely powdered charcoal, in doses of from ten to twenty grains, and of the aloes-and-myrrh pill just enough nightly not to act as a purgative. The air seems to be absorbed, and the peristaltic motions quickened, by this treatment. Should that not be effectual, you can employ strychnine in small doses in the pill.

It is scarcely necessary to say that indigestible articles of diet must be avoided, if the patient would prevent a recurrence of the complaint; and it stands to reason, also, that cold sponging and bathing, sea-water, and, in short, all hygienic remedies which improve the general health, will conveniently accompany the treatment.—*Lancet, August* 22, 1857, *p.* 185.

31.—ON THE DIETETICS OF DERANGED DIGESTION.

By Dr. T. K. CHAMBERS, Physician to St. Mary's Hospital.

[Dr. Chambers truly says that in managing the food of dyspeptic patients, it is well to have some *broad law* to direct us. The following are his directions:]

The leading idea of the first placed and most important rules is simply that of sparing a weak member—working those who can work and resting those who cannot.

I. *When the stomach is off work, spare it, and leave the digestion as much as possible to the intestines.*

This applies to cases of weight and pain after eating, heartburn, acidity, hæmatemesis, vomiting of unaltered food, and fermentation. Should the conjunction of symptoms enable us more definitely to diagnose gastric ulcer, mucous flux, cancer, or any other more definite anatomical change, the application is all the more forcible.

Spare the stomach both its *mechanical* and its *chemical* toil.

The first is the hardest, and therefore most necessary to be avoided. A meal—that is, the laying in of victuals to avoid future rather than present hunger—is a labour, even to the healthy; so do not impose it on a sick stomach. In very bad cases, do not divide the daily allowance into meals at all, but assign such quantity as appears enough for the twenty-four hours, and let the taking of it be spread over the whole time, as equally and with as short intervals as possible. In milder cases it will be sufficient to "*spoil*" the meals—that is, to take food between the usual times, so as to leave neither the necessity nor the inclination for eating at once as much as other people. One would be sorry to recommend to the healthy an over-care for their diet, but to invalids subject to gastric derangement, you cannot do better than

advise an imitation of a famous centenarian witness, examined by the scientific judge, who said he attained his great age by always "eating before he was hungry, and drinking before he was dry."

Take care, however, that your patients do not spoil their dinner and eat it too: that last error would be worse than the first. Make it a rule that the slightest sense of repletion is to be a warning to desist.

Another valuable expedient for sparing the organ, in cases only slightly indisposed, is Dilution of the meal. Copious watery drinks carry the food on quicker through the pylorus, and give great relief to over-sensitive, irritable stomachs. But at the same time it must be remembered that thus the time for the action of the gastric juice is shortened, and its chemical strength lessened, so that more is given for the intestines to do. It is better, therefore, to let this dilution be practised as long after the meal as the case admits of. It should be avoided also as a general rule where an obstructed circulation impedes absorption of the water by the portal veins. Patients with dilated heart, for example, and some cases of anæmia and of diseased liver suffer much inconvenience from a sloppy diet. Obese persons also should avoid dilution; it washes away the albumen which they do want, and allows of the absorption of fat, which they are better without.

The chemical toil of the stomach may be spared by giving it less to digest, and more to digest with. Take care that the weak but well-meaning organ is not reduced to despair by solid lumps of albuminous food. The best form of nitrogenous aliment in these cases is whey, or milk prevented from coagulating by a copious admixture of lime-water. This fluid meat will pass through the stomach unaltered, the gastric juice will trickle through the pylorus at its leisure after it, and with the intestinal juice will digest the casein in the intestines. Next in easy solubility comes soup made fresh, weak, and at a low temperature—fresh, that it may not decompose; weak, that it may be easily absorbed; at a low temperature—that it may not be filled with innutritious gelatine, or with hard-boiled albumen. Meat is suitable in proportion as it is soft, easily disintegrated, free from fat which might oppose the soaking in of the gastric juice, and quickly cooked. The well known list of Dr. Beaumont sets in the order of these qualities a great number of articles of diet. But I think it more useful for you to have the principles of selection, than a mere experimental enumeration of the articles themselves.

To mix starchy food with the albuminous in cases of weak stomach digestion is an irrational practice. It soaks up the little that there is of the valuable gastric juice, and then makes no use of it; for starch is quite unaltered by the peptic solvent. This is very bad economy indeed. Moreover if taken in quantity sufficient to assist much as a nutriment, it is too bulky, and being converted into sugar by the saliva, turns acid in a mass, and puts a stop to further digestion. This

is particularly the case if it is in solid coherent lumps, such as potatoes, soft bread, pastry, and the like.

Starchy food, *unmixed* with albuminous is a different thing altogether. There certainly are some cases of gastric disorder, which are much benefited by a temporary adoption of such a diet. It is the best during acute catarrhal bilious attacks, at the commencement of treatment of even chronic gastric cases, and whenever the dusky complexion, hypochondriasis, and general distress, show that arrested moulting has caused a retention in the body of *effete* tissues. It does good, in fact, as a temporary starvation. Hence you will see me occasionally begin the treatment of such cases by our "simple diet," and still oftener in private practive, where starvation for a time is more generally wanted than in hospitals, I give a patient nothing for two or three days but arrowroot, panada, tapioca, gruel, &c. This enables the congested portal system to disembarrass itself so as to leave a clear space for the taking up fresh supplies.

As you return from a pure starchy, or pure animal diet, to that mixture of the two which is normal and necessary to the healthy condition; or if you consider that the case is not bad enough to oblige you to adopt either one or the other absolutely, you may be of use by so arranging that the two sorts of aliment shall not be together at once in the stomach. For example, let the morning and evening diet be vegetable, and then let several hours pass before and after a midday meal of purely animal food.

Spare thus the stomach by giving it *less to digest*. You need not be afraid of starving your patient by diminishing the quantity eaten. A little digested goes much further than double the amount only swallowed. For example, you saw last time we went round the hospital, a girl, in the corner of Victoria ward, who had gained four pounds in weight during six days, on the sole allowance of three pints of milk and less than twelve ounces of bread per diem. A man (No. 8 in Albert ward) has also visibly gained flesh in the same time, though he has only a pint of beef-tea besides what I mentioned as the girl's allowance. He is too weak to stand in the scales, but the increase is apparent to the eye. Both these patients had, till their admission to St. Mary's, been trying to strengthen themselves by meat, and whatever they could get, but having gastric ulcers did not digest it, and were rapidly emaciating.

Spare it also by giving it *more to digest with*. I mean by supplying an artificial gastric juice. This is a mode of treatment so interesting just now, from our being enabled to do it with novel facility, that I shall make it the subject of a separate short lecture, so as to be able to give fuller details of its practical working.

II. *When the functions of the small intestines are off work, spare them.*

Of acute diseases, this applies particularly to typhoid fever, (during both its height and its sequelæ,) to enteritis, diarrhœa, and cholera;

of chronic diseases, to ulceration, tubercular deposits, either in the peritoneum, Peyer's glands, or mesentery, and, secondarily, to disease of the liver.

What, now, are the functions of the small intestines in relation to different forms of aliment? and what colleagues have they that can be trusted to take their duties during a temporary vacation? They absorb all matters soluble in water and capable of endosmosis, and have in that work all the mucous membrane of the alimentary canal to assist them. They convert starch into sugar before absorbing it, in conjunction with the saliva and pancreatic juice. They dissolve albumen, and convert it into peptone, in conjunction with the stomach. But in the digestion of fat, they have none to help them.

All ordinary *fats and oils*, then, must be rigorously excluded from the dietary of these patients. Even cod-liver oil, so peculiarly wanted in phthisical cases, and so easily digestible, will often become rancid in ulcerated bowels, and aggravate the diarrhœa. If it does aggravate the diarrhœa, depend upon it more harm than good is done by the remedy. Leave it off forthwith; the case is an unsuitable one for it at that stage of the disease. And if cod-liver oil disagrees, *à fortiori* do other less digestible fats. I have known the mere skimming the fat from broth make all the difference whether it were digested or not, and leaving off the simple article of butter make a previously useless treatment immediately successful.

Starchy food will agree only on the conditions that it is taken in small quantities, and that the saliva is in a state to do alone what generally it has the small intestines to help it with. If the secretions of the mouth are deficient, it will not agree. Hence, in typhoid fever, for instance, where the fauces and tongue are dry, you will see me never order arrowroot, bread, panada, gruel, potatoes, or any amylaceous article. Where they are eaten, they will be found unaltered in the fæces, and not rarely cause considerable aggravation of the symptoms. I have particularly observed this in convalescent patients after fever. You are surprised often by an unexpected relapse: examine the stools, and there you see lumps of potato, bits of pastry, or a mass of starch granules. The foolish friends have been disobeying orders, and giving these articles, which cannot act as a nutriment and do act as a poison.

On the other hand, a phthisical patient, with a clean, wet mouth, will generally digest them well, in spite of his ulcerated bowels, provided they are well chewed and are not lumpy.

Albuminous food will agree, provided that the stomach is doing its duty. But you must not forget that it has lost a potent colleague, and be careful to prepare the food so as to require only a short time to digest it. Milk must not be passed on to the small intestines by being guarded with alkalies, but had better be soured and made into whey. Some of the curd, broken up quite small, may be taken with it. Frequent dilution with watery drinks, and use of artificial

pepsine, are of eminent use in these cases, so as to ensure the absorption of the food as quickly, and as high up in the intestinal canal, as possible.

III. *Where you wish to hasten absorption, dilute with water.*

This is so obvious a consequence of those laws of Osmosis which almost every course of lectures, anatomical, botanical, physiological, medical, has occasion to recite, that I will spare you.

The rule finds its chief application in fevers, but it must not be passed over in ulceration of the alimentary canal and other local disorders, where protraction of the process is painful, or in emaciation and convalescence, where we would not wish to waste time, but to give a person all the nutriment possible in the day.

IV. *When you wish to delay absorption, dilute with solids.*

For solids to be diluents, they must of course be incapable of absorption; and the substance I principally refer to is cellulose in its various forms of chaff, bran, husks, skins, seeds of fruit, green vegetables. Cellulose, being incapable of chemical change there, passes unaltered through the alimentary canal, carrying with it first the chyme prepared for absorption, and then adding its bulk to the fæces excreted. Thus the absorption is spread over a longer time and a larger surface of mucous membrane, and the whole brought equally into work. A collateral advantage is that the peristaltic wave acts with more regularity when it has a solid to propel, than when the contents of the tube are fluid only. The rule is useful, not so much at the sick-bed as for the prevention of sickness. Many persons are made ill by their diet being more immediately digestible than they have been used to. Scotch labourers on exchanging oatmeal for wheat-flour, Finn recruits on getting bread at head-quarters without birch-bark in it, country persons on coming to London or Paris, often suffer from this cause. The mode of prevention is obvious and cheap; cabbages, brown bread, and charcoal offering types of treatment readily altered according to taste.

In the administration of medicines, something may be learned from the same expedient. Quinine occasionally will not agree where powdered bark or decoction of bark will yet succeed very well; and the same may be said of the soluble and insoluble salts of iron, of morphia and opium, and similar drugs identical in all but insolubility. I believe the secret is that a slower and more graduated absorption is gained.

I have elsewhere stated reasons for suspecting that gum and gelatine may be classed amongst unabsorbable diluents of the food, and are not really nutritious; but the argument is hardly suited to a practical lecture.

V. *When the diet has been diminished, return* gradually *to the normal in quantity and quality.*

I suppose mere instinct teaches this, for all acknowledge the justice of it as a sort of truism, and agree that a convalescent diet should be

"light" at first, and afterwards more "substantial." Perhaps, as respects quantity, error is rare; but the spirit of the rule in regard to quality is often lost by misinterpreting the words "light" and "substantial." Scientific men must not think vaguely, and you must have clearer ideas than the old nurses who so often hurt your patients by misapplying these expressions. I shall not, therefore, think I am wasting time by explaining what the rule really means.

I formerly divided foods into such as are capable of direct absorption without change, and such as require a previous change by the digestive juices; and the same division has also been adopted by M. Bernard. By subdividing the latter class into such as require only direct chemical change, and such as require disagregation as well, we get three groups of aliments; the first the "lightest" or most digestible; the last the most "substantial;" the second intermediate. M. Bernard observes the first necessitate but one physiological act; the second, two; and the last, three; and, consequently, in that order demand proportionate amount of labour from the system.

Under the first head come water, essential oils, tea, coffee, alcohol, ethers, salts, sugar, whey, gravy (containing osmazome); asses' milk, with its small quantity of butter and casein, and its large allowance of sugar, forms a transition, through cows' milk, to the second class, in which comes soups, lightly-cooked eggs, well-boiled liquid starch; for the third class, tripe, oysters, sweetbread, and boiled chicken come nearest to the second, while the power of digesting hard meats (such as beef) or solid lumps of starch (such as potatoes), show that the full normal powers of digestion have been regained.

This is something definite, and with this idea you will find no difficulty in making a graduated scale up which a convalescent patient may safely mount.

VI.—*The use of alcohol is indicated in diseases—*

1*st. Where the pathological condition limits the due supply of nutriment, and the repair cannot therefore equal the normal destruction.*

2*ndly. Where the destruction is so excessive that the normal repair cannot equal it.*

Under the first head come all acute typhous, and, in fact, all acute diseases, not excepting inflammatory ones, where the "nervous" energy (as it is vaguely called, meaning vitality in general) is defective.

In low fever, if you examine the urine, you find the specific gravity high, and the urea in normal or even in excessive quantity, showing that the nitrogenous tissues are passing away as quickly, or more so, than in health. The phosphates are also going off in the same way and by stool, and the blood exuding into the alimentary canal and bronchi. Yet their place is not taken by fresh tissue—the vital powers are deficient—death is struggling hard to overcome life. What you have to do is to arrest death.

The use of wine in pneumonia, in surgical injuries, and, in short, the not being frightened out of stimulation by the termination in

"*itis*," has saved many a life of late years in this metropolis: and though perhaps it may not be so much required in the more bracing regions to our north-east, still even there the practice is gaining ground against prepossession, showing that it is really beneficial.

Under the same head, too, comes a deficiency, congenital in some individuals, who constitute the half-pitied, half-despised class known as "poor creatures"—persons who, without any classifiable disease, are always over-exerting themselves, and unable to live like their neighbours without failure. From deficient powers, they are unable to assimilate enough to take the place of the interstitial destruction, and therefore if the outgoings are not limited, or the incomings increased by special management, their tissues must suffer, and innumerable ailments arise as consequences of over-destruction. In the management of these cases, dietetics are of the utmost importance, and of dietetics the most important part to them is the judicious employment of alcoholic stimulants. If too much is used, a low state of vitality is induced, which leads to degeneration of the various viscera; the heart may become weak and dilated, or the kidneys shrunk and hard, or the liver contracted and impervious, or the stomach and other glands lose their secreting structure, or the blood become pale and fatty, the skin sallow—in short, some of the evils of chronic alcoholism be set up. If too little, then exhaustion of the nervous and muscular system gives occasion to anæmia, inability to digest food, emaciation and debility; while those with hereditary tendencies thereto run the risk of tubercles of insanity.

The best general rules I can give for the attainment of the golden mean of alcoholic stimulation are the two following:—

First, *let the form be dilute.*
Second, *let the effect of one dose go off before another is taken.*

The dilution of an accessory drink makes it a better measure—a man easier finds out when he as had enough. Besides, the direct effect of the alcohol on the mucous membrane is avoided.

A strict observance of the second rule enables us to shun all the dangers with which teetotalers threaten the moderate consumer, and the neglect of it constitutes the peculiar risk of spirit-drinking. It is a familiar fact, that men take their pint of wine or beer daily throughout their working life, feeling daily the same beneficial exhilaration; but if once they begin to experience depression afterwards, and to relieve that depression by fresh doses of alcohol—"a hair of the dog that bit them"—temperate use is at an end, abuse has begun—in order to produce the original effect, the quantity requires to be continuously increased, and then commences the slow interstitial death, which is the goal of the habitual spirit-drinker.—*Lancet, Oct.* 17, 1857, *p.* 383.

32.—ON DYSPEPSIA.

By Dr. Leus, Physician to the Meath Hospital, Dublin.

[By dyspepsia is meant a derangement of the natural functions of the stomach, quite independent of any organic or inflammatory disease of that viscus. It is often a very troublesome affection to treat and the treatment must be constantly varied according to the cases.]

Excessive *acidity* of the stomach is a very constant and troublesome symptom, being more often met with, and in a greater degree, in its functional derangements, than in its actual diseases. The gastric juice, in a healthy stomach, ought to be merely secreted in sufficient quantity to act on the food, which if it be of an indigestible kind, or if detained too long in the stomach, then not only an excess of the natural acids (the muriatic and lactic) may be secreted, but other acids—especially carbonic acid—may be generated by a process of fermentation, which causes distention and flatulence. The best treatment for this condition is, first—to regulate the quantity and quality of the food, keep the bowels open by some warm aperient, particularly if the patient be of a gouty habit, give then a few grains of rhubarb, with one of capsicum, in a pill just before dinner, and a few grains of bi-carbonate of soda, or potash, about one hour after meals. Let the drink be water; and if a stimulant be required, a little brandy or sherry well diluted or aromatic spirit of ammonia in a little water. Another troublesome symptom of dyspepsia is *heartburn*, or cardialgia, characterised by a sensation of heat or acidity at the cardiac orifice of the stomach, often extending up the œsophagus, and sometimes accompanied by the regurgitation of an intensely sour fluid, or acid gas, very perceptible to the taste or smell. In most cases it comes on in from one to three or four hours after taking food, is a result of faulty digestion, and mostly met with in persons who lead sedentary lives, or have their minds actively engaged in business. But there is another form which comes on almost immediately after taking food, and often subsides as suddenly, so that it may be termed nervous, especially as it occurs chiefly in persons of a nervous temperament, and who have suffered from exhausting diseases, or mental depression. Dr. Chambers states that this form is often worse after the early than after the later meals of the day, even though the diet should be more sparing, and more digestible.

In this form of heartburn our great aim should be to remove the exciting cause, and invigorate the system by the preparations of valerian, iron, and quinine; but we should commence the treatment by some medicines which we know will act directly on the stomach, as bismuth, hydrocyanic acid, or morphia; but in the first form described you will generally give relief by a few grains of bi-carbonate of soda or potash; and in some cases the mineral acids will effect a speedy cure. The late Dr. Prout was very partial to the use of these acids in this condition of the system, especially if there was much flatulence and

palpitation, or irregular action of the heart after meals, and if oxalate of lime could be detected in the urine; and Dr. Budd says, that "they are often useful to persons in whom digestion is habitually slow and feeble from a scanty secretion of gastric juice, and who have a sense of weight, or oppression of the stomach after meals."

Waterbrash, improperly termed *pyrosis*, is another very distressing symptom of dyspepsia, and consists in the regurgitation, or sudden gush of a watery or glairy fluid, often insipid, but sometimes highly acid, so as to set the teeth on edge, not painful, but often giving a sensation of extreme cold. Dr. Cullen, who had much experience in this disease, states that its paroxysms "usually come on in the morning and forenoon, when the stomach is empty. The first symptom of it is a pain at the pit of the stomach, with a sense of constriction, as if the stomach was drawn towards the back. The pain is increased by raising the body into an erect posture; and therefore the body is bent forward. The pain is often very severe, and after some time an evacuation of this watery fluid, varying in quantity from a mouthful to a quart, or even more, takes place." The appetite may be good, but there is often thirst and emaciation. In most cases it is a functional disorder, and is accompanied by other symptoms of dyspepsia; but it may be symptomatic of organic disease of the stomach, or caused by an enlarged liver pressing on this viscus. It affects the female more than the male sex, and is especially liable to occur during pregnancy, if at an early period, owing to the peculiar sympathy which exists between the uterus and the stomach; and when occurring at a late period it is probably caused by the pressure of an enlarged uterus on the stomach.

There is much difference of opinion as to the source of the fluid in pyrosis; but I believe it is a morbid secretion, derived (when acid) principally from the mucous membrane of the stomach. However, in these cases, it is not pure gastric juice, but consists of muriatic and lactic acids mixed with mucus and water; but if the fluid be alkaline, it is probably derived chiefly from the salivary and other glands in the mouth and pharynx, for it then exhibits the ordinary characteristics of saliva, as it is alkaline and opalescent from the presence of the epithelium of the mouth and throat. Dr. Frerichs states, that it converts starch into sugar, and contains cyanide of potassium; so that in these cases it is more likely to be the secretion of the salivary glands, mouth, and œsophagus, rather than a watery discharge from the gastric mucous membrane. In fact, the discharge takes place in a healthy part by reflex irritation from a diseased one; but we cannot determine any fixed rules from the mere acidity or alkalinity of the secreted fluid. In some cases the fluid gushes into the mouth, without any spasm of the diaphragm, or previous warning; but in most it is preceded by a sense of uneasiness at the epigastrium.

The causes of pyrosis may be divided into idiopathic and symptomatic. The first form, common to both sexes, often met with in the lower classes of society, is chiefly due to errors in diet; the second

form is mostly met with in females of the better circles, and caused by some fault in the uterine or nervous system. If the diet has been too poor, or too farinaceous, we must improve it by giving a fair supply of animal food before we can expect any change; but if the uterine or nervous system be out of order, we must direct our remedies to them in the first instance. In most cases there is an over secretion of mucus from the stomach, so that astringent medicines are of use, and of these bismuth, lime water, kino, catechu, rhatany, are useful. Nitrate of silver is of use, as it acts also on the nervous system; but a great objection to these medicines is, the constipation they occasion; so that we must keep the bowels open by enemata, or some aperient medicine, which will act on the intestines. Nux vomica is said to be a popular remedy among the Laplanders, who suffer much from this disease; and Dr. Budd says it may be given in pill, in the dose of from three to five grains, three times a day.

Mineral acids are often of great use, but they should be taken when the stomach is empty, as they check the morbid secretion of fluid by their immediate action on its mucous membrane, whereas alkalies ought to be given while digestion is going on, as they act by neutralizing the acid secretions, which are poured out during that process; so that "it is not irrational practice to prescribe regular doses of acids and occasional doses of alkalies for the same patient, but at different periods of the day, each medicine fulfilling a separate purpose."

If severe pain be felt you must have recourse to sedatives, one or two drops of dilute hydrocyanic acid, with five grains of bi-carbonate of soda, in one ounce of water, will often give great relief, or ten to twenty drops of chloroform may be given, and if these fail, use opium, commencing with one-sixth of a grain three times a day, combined with extract of aloes. Dr. Pemberton was very partial to the compound powder of kino; but its efficacy was probably chiefly owing to the opium it contains, as it not only relieves pain, but also acts as an astringent, and checks the morbid secretion. In some cases, particularly those where the liver is deranged, from three to four grains of Plummer's pill every second or third night, will be useful; in other cases, some of the preparations of iron are found to succeed; but no medicine can effect a cure unless great attention be paid to diet, which should consist of plain-dressed animal food, chiefly roasted, and eaten slowly with a small proportion of well-boiled vegetables. Fat, fried, baked, or stewed meats, should be avoided, pastry, salads, acid or dried fruits, pickles, fermented liquors, and rich fish, as salmon or herrings. Some cannot eat potatoes without bringing on an attack; in others tea induces it. Sedentary habits predispose to it, particularly if the patient is closely confined to a desk, and obliged to work after dinner. These persons are sometimes sufferers from a form of rumination, owing to the solid food, particularly meat, regurgitating into the mouth at various intervals during digestion. It differs from vomiting, in not being preceded nor accompanied by nausea, or any violent expulsive effort. It is the same affection as that which has

been so well described by Sir H. Marsh as the "Regurgitant Disease," and which he conceives to be chiefly connected with hysteria and struma. But he states that "in some cases of this singular affection there is present a symptom which indicates the co-existence of dyspepsia, viz., an oppression of the epigastrium;" and also he has met with cases characterized by severe gastrodynia, pain on pressure at the epigastrium, epigastric pulsation during digestion, gaseous distention and eructation, impaired appetite, and regurgitation not only of acid or bitter fluids but also of masses of half digested food. He recommends in these cases a drop of creasote, with one-fifteenth or one-twentieth of a grain of muriate of morphia in pill three or four times a-day, with the compound aloetic pill as an aperient, or prussic acid with or without a few drops of solution of morphia. Slow eating, perfect mastication, food well selected and restricted in quantity, constitute essentials in the treatment. In fact, these cases are to be regarded as forms of dyspepsia, and must be chiefly managed on general principles.

Pain in the Stomach; Gastrodynia.—Pain in the stomach is met with under a variety of circumstances, and in very different, or even opposite, conditions of that viscus. Thus it occurs not only as a symptom in its inflammatory and organic diseases, but it may be equally severe when sympathetic of other diseases in remote parts of the system, as in females affected with uterine disorders; or in even a still greater degree in its mere functional and nervous derangements, in which we cannot detect any appreciable alteration of structure. To these latter forms the term gastrodynia is usually applied; and I will therefore consider them under this term, as distinct from the former. Dr. Abercrombie states, that "pain in the stomach occurs in practice under *four* different forms, which seem to imply important differences in the nature of the affection." 1st. "Pain occurring when the stomach is empty, and relieved by taking food." He considers that this form depends on some degree of acrimony of the fluids of the stomach itself, and is generally relieved by absorbent and alkaline remedies, such as aromatic spirit of ammonia, or magnesia. 2nd. "Pain occurring *immediately* after taking food," and which he thinks is connected with chronic inflammation, or increased irritability of the mucous membrane of the stomach, and should be treated by remedies suitable to that state. 3rd. "Pain beginning from two to four hours after a meal." This, he thinks, is seated in the duodenum, and connected with inflammatory action or morbid sensibility of its mucous membrane; but as it is often accompanied by pain and tenderness on pressure, in the right hypochondrium, it is often mistaken for disease of the liver. He recommends the sulphate of iron in doses of two grains, combined with one grain of aloes and five grains of aromatic powder, taken three times a day; also lime-water, opiates, and bismuth, combined with rhubarb. Dr. Watson considers that this form of pain is caused by acidity in the primæ viæ, and he prevents it by directing

the patient to take a small quantity of alkali in some aromatic water, immediately after his dinner, or a cup of warm tea, by which the acid is diluted. The fourth form of pain in the stomach "occurs at uncertain intervals, in most violent paroxysms, with a feeling of distention, much anxiety, and great restlessness." Dr. Abercrombie considers that it depends on over-distention of the stomach, or may be sometimes seated in the arch of the colon, and is best relieved by carminatives, or by a strong injection. Dr. Watson says that hydrocyanic acid is a most valuable remedy in these cases, also opium; but you should never neglect the use of external applications, as you will give great relief by very hot stupes, particularly if sprinkled with turpentine; or apply a large mustard poultice over the epigastrium. Persons of a gouty habit are very liable to be attacked with this kind of pain, which in them is generally best treated by stimulants and opiates, as brandy and laudanum, with sinapisms applied to the epigastrium and feet; but you should remember that there is a form of inflammatory gout which occasionally attacks the stomach with violent pain, attended with fever, and demands an opposite line of treatment. In all these patients great attention should be paid to the diet, which must be adapted to each particular case, as what will suit one may not agree with another; but as a general rule, the food should be given at regular periods, in small quantities at a time, and of a plain, light kind, easily digestible.

I will now proceed to consider the true gastrodynia, by which term I mean an affection of the nerves of the stomach, not connected with any change of structure, but characterised by violent attacks of pain coming on in paroxysms, sometimes induced by taking food or drink, but frequently coming on suddenly, without any assignable cause, and often ceasing in a similar manner. The character of the pain varies: some describe it as cutting or stabbing, others as a tearing or burning pain; some say they feel as if the stomach was about to burst, others as if it was constricted by an iron band; and some say they feel as if an animal was creeping inside of them. The pain is seldom continuous, but intermits and recurs again; is not excited nor aggravated by pressure of the hand, but is often relieved by it; and though often so severe as to make the sufferer assume every position, in order to get relief, and even unloose their clothes or stays, so as to take off pressure from the epigastrium, yet it is rather owing to morbid irritability of that part than to any actual tenderness. The pain often radiates round the sides, up the chest, to the shoulders; and sometimes, in females, there is great tenderness in the dorsal region, and pressure on this part aggravates the pain in the stomach. They are often in a state of great anxiety, and sometimes there is violent pulsation in the epigastrium; but the pulse is generally quiet, and there is no fever. The pain may be very violent, and then cease suddenly in a few minutes, leaving the patient nothing the worse, or may last some hours, and then cease gradually, but often leaves the patient tired and exhausted, with a

sensation of soreness at the epigastrium. The termination of the paroxysm is sometimes marked by copious eructations of gas, which come up without any effort, and give great relief; in other cases there is a flow of water from the stomach, either insipid or very acid; and in some cases there is vomiting of mucus. The appetite is variable, sometimes increased, at other times diminished, often not affected; while in some cases, particularly in chlorotic females, the most indigestible things are frequently wished for, and there may be even perversion of the natural appetite. Thirst is seldom complained of, and the tongue is often natural in appearance, but may be large and moist, or thickly coated with a whitish fur. They often suffer from headache, costive bowels, irritability of temper, and become hypochondriacal, with all the symptoms of aggravated dyspepsia; but in other cases, though the paroxysms of pain may be very severe, yet there may be no other symptom of dyspepsia, and the patient may digest the food well, and be in good condition. This difference in the symptoms may be accounted for by a difference in the form of the disease. One form, which we may term functional, appears to be caused by an excessive secretion of unhealthy mucus, which deranges and oppresses the stomach, and is often met with in the lower classes of society, chiefly caused by errors in diet, or abuse of stimulants; but prolonged fasting, or drinking large quantities of diluents—as tea, or even water—may have the same effect. Mechanical causes—such as injuries, certain sedentary professions or trades, in which the body is bent up or stooped forward, particularly if after meals; pregnancy also, or any tumour in the abdomen—may cause it, by making pressure on the stomach, and thus interfering with its functions. Certain medicines, also—as the preparations of iodine, balsam of copaiba, quinine, and iron, if continued too long—may have the same effect; so that their use ought to be suspended for a short time occasionally. It is this form of the disease which Dr. Barlow has described, in an excellent article in the 'Cyclopædia of Practical Medicine'; but I think he is wrong in applying to every form of the disease his pathology of gastrodynia, "which assigns the spasmodic pain to the presence of offending mucus, and the efforts of the stomach to get rid of it." The second form, which I will term symptomatic, is essentially a neuralgia; and though very similar to the last form, as regards the pain, yet it differs in its causation, and in its being unaccompanied by any other symptom of dyspepsia. This form of gastrodynia may depend on many different causes. 1st. Disturbance of the nervous system—as anxiety, anger, fear, hysteria, over-study, particularly if after meals. 2nd. Alteration in the quality of the blood—as in anæmia, chlorosis, purpura, scurvy. 3rd. Hemorrhages. 4th. Syphilitic, mercurial, paludal, and gouty cachexia. 5th. Diseases in other parts of the system. 6th. Venereal excesses or masturbation in either sex. 7th. Worms. 8th. Hereditary influence. 9th. Sex, as it occurs more frequently in females, particularly in those of a sedentary habit, or subject to depressing influences, either mental or bodily. 10th. Lactation in delicate females, especially if prolonged.

The differential diagnosis of this disease is of great importance for the prognosis and treatment. It is most likely to be confounded with —1st. Simple chronic ulcer of the stomach, as it occurs in much the same class of patients, and the character of the pain is very similar in both; but the aspect of the patient, the history of the case, the irregularity of the attacks of pain, being often quite independent of food or drink taken into the stomach; but, above all, the absence of vomiting of pure blood, or of coffee-ground matters, will generally help us to decide; though in some cases where these symptoms are absent, the diagnosis is sometimes very difficult, as I experienced in the case of a female who was under my care in Meath Hospital, and in whom the paroxysms of pain were attended with great nervous depression, and tendency to collapse, very similar to a case of perforation of the stomach which had occurred some time previously in the same ward. 2nd. Calculus in the cystic or hepatic ducts, or in the gall-bladder, may simulate it; but the severe nausea and vomiting will generally enable us to make the diagnosis. 3rd. Chronic gastritis; but the absence of pain on pressure (though the spontaneous sensation of pain may be very severe), the irregular course of the disease, its intermissions, and the character of the urine, which is rather anæmic than inflammatory, will generally assist us. 4th. Cancer; but the absence of the peculiar cachexia, the emaciation, the non-existence of tumour, or of coffee-ground vomiting, will guard us from such a mistake. Dr. Budd is of opinion, that if the pain depends on organic disease, it is more severe soon after meals, or when the stomach is full; but if it is the result of functional disorder, it will only occur when the stomach is empty, and will be relieved by food; but this rule does not hold good in even a majority of cases, though attention to it is of great importance with regard to treatment, as in the first class of cases the diet should be light, easily digested, and our efforts directed to relieve irritation; while in the second class of cases, sedatives generally relieve the pain.

Gastrodynia is a disease of youth and adult life, but seldom attacks before puberty, and is generally curable, though it often continues a long time, and is very liable to relapse, particularly in persons of an irritable and nervous temperament, or in those subject to neuralgia in other parts of the body. There is no disease for which a greater number of remedies have been proposed, than for gastrodynia, and among these narcotics and sedatives hold a high place; but never commence the treatment of a case without having ascertained (as far as you can) to which of the forms above described it belongs, and then be regulated by the cause. If you are satisfied that there is an unhealthy secretion of mucus by the stomach, you should try to get rid of it, and correct the condition of the mucous membrane which secretes it. Emetics of sulphate of zinc or ipecacuanha are occasionally useful, but in most cases they are not necessary; and you may commence the treatment by two or three purges of calomel with compound colocynth

pill at night, followed by neutral salts with magnesia in the morning, so as to act well on the bowels, the discharges from which are generally dark, fetid, and slimy; and you must first improve this condition before you can expect any real change for the better. You may then give an alterative dose of blue pill or calomel every second or third night, followed by a saline aperient in the morning. If a costive state of the bowels persists, Dr. Barlow advises four grains of colocynth with two of henbane every night, and the daily use of an ounce of the following cordial saline mixture, of which he speaks very highly:—

℞. Sodæ subcarbonatis, ℈iiss.; aquæ puræ, ℥viiss.; acidi sulphurici diluti, ℥ss.; confectionis aromaticæ, ℥iss.; spiritûs menthæ piperitæ, ℿxii.

Great attention should be paid to the diet, which ought not to be too farinaceous or very liquid. Commence with good chicken-jelly or beef tea, but get them to eat some solid tender meat as soon as you can, and for drink allow weak brandy and water. Bismuth in doses of five or ten grains, either plain or combined with magnesia, often acts well; so does calumba combined with soda. These are also the cases in which nitrate of silver has often given great relief. You may commence with a quarter of a grain three times a day, combined with aloes or extract of gentian, and let it be washed down with a little water, either cold-boiled, or tepid, or warm, according to the wishes of the patient. In some cases patients complain that any cold drink causes pain, so that you must give them even their medicines in a warm menstruum. In the symptomatic form of gastrodynia, the first object is to relieve the severe pain; and for this purpose you must have recourse to the various narcotics and sedatives, the preparations of opium, morphia, belladonna. Prussic acid combined with soda or bismuth often gives great relief; so does conium and creasote. Nervous medicines are sometimes useful—as valerian, camphor, assafœtida. Dr. Aquila Smith informs me that he often gives immediate relief by making the patient eat a few blanched sweet almonds. The preparations of iron and bark are used as preventatives. Vesication over the epigastrium, and dressing it with morphia, often gives relief. The late Dr. Graves had a high opinion of stramonium in this affection; he also advised friction over the dorsal vertebræ with a stimulating liniment; and Dr. Law informs me that he often applies tincture of iodine to the spine with good effect. The diet should be tonic and substantial; in most cases meat and wine may be given. Great attention should be paid to the functions of the skin; tepid bathing, shower-baths, sea-bathing, and plenty of exercise in the open air, should be persevered in. These patients should be freed as much as possible from care, business, or study. Make them sleep on a mattress, in a well-ventilated room; give up tea, coffee, smoking, snuff, and every habit that can debilitate the nervous system; get them to mix in society; but above all things, if they can afford it, send them to the country, or to travel, or to some of the watering-places; and always

endeavour to inspire hope of a certain cure, and confidence in the means, as there is a great tendency to hypochondriasis in all these cases.

Headache; Condition of Urine, and Sympathetic Affections of Dyspepsia.—One of the most common and constant symptoms of dyspepsia is a sense of *fulness* of distention of the stomach, coming on a short time after food, attended with a sense of constriction, as if the clothes were too tight, so that patients are glad to loose them, in order to get relief; and they are often much annoyed by *flatulence* and eructations of gas, with great rumbling of wind in the large intestines. If this comes on after food, it may be prevented by taking a pill of four grains of rhubarb with one of capsicum before meals; but if it comes on when the stomach is empty, give some carminative —as from thirty to forty drops of tincture of cardamoms, or compound spirit of lavender, or aromatic spirit of ammonia, in a little water, either plain or with a few grains of calcined magnesia. Constipation is another troublesome symptom, and the evacuations are generally dark, very fœtid, often slimy or pultaceous. For this you should give some mercurial, combined with colocynth or rhubarb pill. to act on the liver and large intestines, so as to cause solid evacuations; for undigested substances may remain in the cells of the colon or cæcum for a long time, even though the bowels be moved daily; but be cautious of over-purgation, for patients are often anxious to take medicine, as it gives them temporary relief, by removing unhealthy secretions, whereas our endeavour should be to prevent their formation, which is best attained by improving the functions of the liver, the stomach, intestinal canal, and the skin, which last is generally dry and rough, or covered with a greasy perspiration. These patients often complain of a peculiar dry, prickly, pungent heat in the palms of the hands and soles of the feet, especially at night. while during the day they are chilly; and the face is pale, with a heavy, dull expression. The appetite may be variously affected—often diminished, or even totally absent, especially before breakfast; or there may be nausea and loathing at the very sight of food, while at other times it may be increased, or even ravenous. To restore or correct this, give an ounce of infusion of chiretta, or half a grain of sulphate of quinine (three times a day) half an hour before meals; but when there is disgust at food, you will find much benefit from pepsine, which generally causes an appetite; and in cases where severe pain or uneasy sensations are experienced after meals, depending on deficiency of the gastric juice it is of much use. It should be taken immediately before meals, either in the form of powder dissolved in a spoonful of soup or sweetened water, or rolled up in a wafer, as recommended by Corvizart, Boudault, and Ballard, in doses of fifteen grains, or in drachm doses of "liquor pepticus præparatus," recommended by Dr. David Nelson, of Birmingham, which I believe is analogous to prepared rennet. Nausea and vomiting are sometimes very distressing symptoms, espe-

cially if there be much bilious fluid ejected; but you can generally give much relief by regulating the diet, acting on the bowels by enemata, and giving bicarbonate of soda in solution with dilute hydrocyanic acid, or in effervescence. Bismuth will be of use also, or creasote with aloes in pill. The tongue may present a perfectly healthy appearance, or be coated with a white fur, or be red at the tip and edges, or may be thick and œdematous, retaining the impression of the teeth; and patients often complain of a disagreeable clammy taste in the mouth, particularly in the morning, with a peculiar heavy odour from the breath. The urinary secretion varies greatly in dyspepsia: it may be scanty, of a deep red colour, and very acid, often depositing lithate of ammonia or lithic acid crystals; or it may be of a bright amber colour, very clear and acid, with a slight cloud at the bottom, formed of mucus, with minute crystals of oxalate of lime, sometimes visible to the naked eye if exposed to a bright light, but always to be seen under the microscope; or it may be of a high colour, and yet deposit a white sediment formed of phosphates, which is characteristic of a highly irritative form of dyspepsia; or it may be pale, and become alkaline shortly after being passed, depositing triple phosphate with phosphate of lime; or, finally, it may be passed frequently, and in great quantity, like pure water, when the patient labours under much nervous excitement. In the first of these conditions, Dr. Prout recommends fifteen grains of bicarbonate of soda or potash to be taken three times a day, two or three hours after meals; while to counteract the oxalate of lime, he advises the nitric or nitro-muriatic acid, from ten to twenty drops of the dilute acid half an hour before meals, in water or some bitter infusion. If the patient be much debilitated, give some preparation of iron about an hour after meals; and if there be much nervous irritability, Dr. Golding Bird recommends sulphate of zinc, in doses of a grain three times a day, made into a pill with extract of hyoscyamus or gentian, and gradually increasing the dose up to five grains—a practice which I have seen attended with much benefit. If the urine be alkaline, with deposit of phosphates, you must try to improve the general health by good diet, wine, or brandy and water, tonic medicines, acids, quinine, or iron; and if the secretion of urine be pale, copious, and frequent, you should give valerianate of zinc, or equal parts of infusions of valerian and bark. Besides these symptoms which we may refer directly to the digestive organs, there are many others which we term sympathetic, or affecting distant parts—such as cough, palpitation, intermission of the pulse, anomalous pains in various parts of the body. A "stomach cough" may be generally distinguished from that depending on disease of the lungs by the uneasy sensation referred to the epigastrium, and by its being hard, loud, and coming on in paroxysms generally after meals, and early in the morning. Palpitation is often a very troublesome symptom, and gives much alarm to the patient, as he supposes he is a victim to disease of the heart. Dr. Abercrombie states that "the slightest, and perhaps the most common form,

consists of a momentary feeling of rolling or tumbling motion of the heart, like that which is produced by a sudden surprise or fright; and it is accompanied by an intermission of the pulse, and sometimes by a feeling as if the heart were violently grasped." In other cases there are violent fits of palpitation, with a sense of tumult in the region of the heart, which recur frequently, with or without irregular action of this viscus; and sometimes there is an endocardial murmur, and dyspnœa, which may come on in paroxysms. An accurate physical examination will generally enable us to make our diagnosis, in which we shall be assisted by the history of the case, "by the action of the heart being natural during the intervals between the attacks, by the symptoms being most apt to occur while the patient is at rest, especially after meals, not being increased by bodily exercise, but rather relieved by it, and by the result of treatment directed to the stomach." But you should remember that dyspepsia is often a result of tubercular disease of the lungs, or of organic disease of the heart; so be always careful in your examination, and cautious in your diagnosis. There is another class of symptoms which have reference to the nervous system, and also cause much distress—such as vertigo, noise in the ears, confusion of thought, defective memory, spectral illusions, irritability of temper, vacillation, despondency; in fact, a state of hypochondriasis, with a want of mental and physical energy often amounting to complete prostration, or rather a sense of debility often more distressing than actual weakness. I have not time to do more than merely enumerate these symptoms for you, and I must refer you for a full description to the admirable work of Dr. James Johnson, who, having been himself a martyr to dyspepsia, has graphically described them.

The causes of dyspepsia are numerous and various; they may be divided into physical and moral; of the first class, some act directly on the stomach itself, owing to errors of diet, whether in regard to quantity or quality. The diet may have been insufficient, either from poverty or prolonged fasting, or may have been rich, indigestible, and in too great quantity, or strong tea may have been indulged in. Dyspepsia may be sympathetically induced from disease in distant parts of the body, as we constantly see in the case of females, in whom it is often excited by some derangement in the uterine system, whether it be leucorrhœa, dysmenorrhœa, ulceration of the os uteri, chlorosis, hysteria, pregnancy, or be caused by lactation. We meet with it also in cases of tubercular disease of the lungs, in diseases of the kidneys and bladder, and also in cases of stricture of the urethra, in piles, and in protracted or exhausting hemorrhages. The second class of causes depend on the state of the nervous system, and mostly occur in persons of the upper classes of society, and of an irritable nervous temperament, usually a result of exciting or depressing passions; or in those who speculate largely, or who have met with reverses of fortune, and have suffered much anxiety of mind, particularly if the patient be

of sedentary habits, and inclined to eat too much animal food, or indulge in pastry. The state of the blood, also, has much influence in causing dyspepsia, whether it depends on mere congestion, as we daily see in cases of diseases of the heart or in capillary bronchitis, especially when occurring in aged or debilitated persons; or whether there be actual impurity of the blood, from defective action of some of the excreting organs, as in cases of congestion or disease of the liver, when the elements of the bile are not properly eliminated; or if there be any disease of the kidneys which interferes with their functions, as we see in Bright's disease, when the urea and other constituents of the urine are retained in the blood, and have even been detected in the matters vomited. Dyspepsia often depends on some fault in what Dr. Prout has termed secondary assimilation, when, though we cannot detect any visible structural change, yet that there is some defect in the nutritive processes is indicated principally by the various conditions of the urine, that I have already referred to. It is probable, however, that some changes occur in the pepsine glands which exercise an influence over the quantity and quality of the gastric juice; for, notwithstanding the important and accurate anatomical as well as microscopical researches of Dr. Handfield Jones and others, into the intimate structure of the stomach, there are, possibly, deviations from health of the gastric mucous membrane, and of the epithelial cells, which we have not yet detected, but which are the causes of deranged digestion.—*Dublin Hospital Gazette, Aug.* 1, *June* 1, *and Oct.* 1, 1857, *pp.* 225, 169, 293.

33.—ON SOME DISEASES OF THE LIVER.

By Dr. George Budd, F.R.S., King's College, London.

[Dr Budd, in the third edition of his work on "Diseases of the Liver," lately published, sums up with great care and perspicuity the more important researches of Lehmann and Bernard upon the chemical properties and microscopical appearances of the blood, as it passes through the liver.]

A most important novelty described by Dr. Budd, is the relation recently found to exist between hydatid tumours and other forms of cystic entozoa on the one hand, and tapeworm on the other. Küchenmeister caused dogs to eat fresh and living cysticeri, and found, upon examination, that in the intestines of these quadrupeds, the cystoid worms were converted into tapeworms. Siebold also found that the cysticercus pisiformis, which is common in the liver and mesentery of the hare and rabbit, the cysticercus tenuicollis, common in the mesentery of sheep and oxen, the cysticercus cellulosæ, often found in great numbers in pork, and the cœnurus cerebralis—are all developed in the intestine of the dog into a long tapeworm, the tænia serrata of the dog; which Siebold considers to be identical with the tænia solium

of man, and also with the tænia marginata of the wolf, the tænia crassipes of the fox, and the tænia intermedia of the polecat, all these being varieties of the same worm. By killing dogs at different intervals after they had swallowed the cystoid worms, Siebold was able to trace their metamorphosis into tapeworms; and since the publication of his researches on the production of tapeworms from the various cystoid worms, the converse experiment has been performed, and cyst worms have been produced from the eggs of the tapeworm. In one of these experiments, M. Haubner, a Professor in the Veterinary College at Dresden, gave joints of the tapeworm of the dog, containing fully-developed eggs, to several lambs, and in the course of a fortnight all these lambs had the staggers, while other lambs in the same fold remained in good health. The staggering lambs were killed after different intervals, and in their brains and other parts of their bodies, cystoid worms were found in different stages of development. In another experiment, made by Professor Leuckart, of Giessen, mice were made to eat ripe joints of the tænia crassicollis of the cat, and the result was the development of cysticercus fasciolaris in the livers of the mice. Another point briefly alluded to, but not at present confirmed by Dr. Budd, is the late announcement by Virchow, that the "scrofulous enlargement" described by Dr. Budd, gives with a solution of iodine the chemical reaction of starch, like the so-called *amyloid* bodies occasionally found in the brain, a circumstance which has led Virchow to propose the name of *amyloid degeneration* to this condition of the liver.

Cirrhosis of the Liver.—[The following passage from the author's work is well worth perusal.]

"The emaciation and the loss of strength that occur in cirrhosis may depend, in part, on direct injury to the stomach and other organs, caused by the habits of life that induce cirrhosis; but they are, no doubt, mainly owing to atrophy of the lobular substance of the liver, and to the impediment which the disease creates to the passage of blood through the liver, and to the escape of bile from it. The obstructed circulation impedes the absorption of water and other nutritive substances by the veins of the stomach and intestines; keeps the mucous membrane of this portion of the intestinal canal, and the glands associated with it, in a permanent state of congestion, and thus enfeebles the digestive power; and when the obstruction is so great that the blood is diverted from its appointed channel, it must tend directly to produce an impure condition of the blood. That part of the portal blood which does not pass through the liver, but finds another way back to the heart, cannot be freed from the principles of bile, and be otherwise purified, as it should be, and must therefore contaminate, to a certain degree, the whole mass of blood with which it is mixed. Impediment to the escape of biliary matter from the lobules and through the small bile-ducts, impairs nutrition directly, by causing a deficiency

of bile in the intestinal canal, and a bilious impregnation of the blood; and it has a more remote injurious effect, by being an additional cause of atrophy of the lobular substance. Destruction of the lobular substance of the liver tends to impair nutrition, by rendering the secretion of bile defective, and thus deranging the work of the intestinal canal, and by leading directly to an unhealthy and impoverished condition of the blood, which, in consequence of this destruction of the lobular substance, is imperfectly filtered in the liver, and does not undergo there those reparative changes which the action of the healthy liver causes. Whenever, from any cause, much of the lobular substance of the liver is destroyed, a state of anemia results."

In treating of the therapeutics of cirrhosis, Dr. Budd strongly insists upon the necessity of the early adoption of remedial measures, although from the insidious nature of the malady it often escapes notice, or is neglected by the patient. It is well known that Dr. Budd considers cirrhosis to be a species of inflammation, and his treatment is depletory, in accordance with this view. But in the more advanced stages, as where ascites has supervened, treatment may still be serviceable.

"Even at this stage of the disease, if there have been any recent inflammatory action in the liver, and there be lymph within it that can still be absorbed, good may result from small doses of blue pill or iodide of potassium, which may be given in conjunction with mild diuretics. If diuretics be given alone, they generally fail of effect, because when, from cirrhosis or any other condition, much ascites exists, the liquid in the peritoneal sac compresses the kidneys, and prevents their action. The influence of this pressure is made very manifest by the operation of tapping. It is almost constantly found that when by tapping the liquid in the belly is withdrawn, there is a more abundant secretion of urine, and that the quantity of urine again diminishes as the liquid in the belly collects again."

Again:—

"In a few instances, after mercury and diuretics have failed, I have seen the ascites removed for a time by hydragogue purgatives. A good purgative of this class is an electuary made by mixing cream of tartar and jalap, in equal parts, with confection of senna, and it is best given, as are all medicines of similar action, in a single dose in the morning before breakfast, as it then, besides the drain it causes from the coats of the bowel, only sweeps away the refuse of digestion; whereas, if it be given in divided doses during the day, it sweeps away the food that has been digested, but the nutritious particles of which have not been absorbed. It sometimes happens, especially in hard drinkers, that a disposition to nausea exists in the morning, and the medicine is then best given at night. The action of hydragogue purgatives is much increased by giving them in a concentrated form, and by restricting as much as possible the quantity of liquids consumed by the patient."—*Med. Times and Gazette, June* 27, 1857, *p.* 649.

34.—*Treatment of Diarrhœa.* By W. O. Markham, Esq.—[The author recommends the use of the compound ipecacuanha powder in cases of ordinary diarrhœa.]

It may seem very superfluous to speak of so well-known an article of the pharmacopœia; but I do so for two reasons :—First, because I do not find, on inquiry among professional friends, that the drug is one in common use for the purpose indicated; and, secondly, because, having used it for many years, and rather extensively, I can safely state, that I know no other remedy equal in efficacy to it, as a cure for diarrhœa.

Five grains in powder, given in a teaspoonful of gruel, and repeated after each loose stool, is the simplest way of its administration. The powder acts better than the pills of it, for these are apt to become hard and indigestible.

Of the theory of action of the drug I have nothing to say. It may be suggested that opium is no novel invention in diarrhœa; but in answer I must observe, that Dover's powder is not opium. All I know is, that I give the drug, and that it very rarely fails to fulfil the indication for which it is exhibited.—*Medical Times and Gazette, Aug.* 29, 1857, *p.* 231.

35.—NEW TREATMENT OF CHOLERA.—ITS ORIGIN AND CURE.

By A. C. Boate, Esq., late one of the Surgeons to Her Majesty's 6th Dragoons (Inniskillens.)

[Cholera is originated in the brain and spine by some magnetic or electrical condition of the earth and atmosphere withdrawing or suspending their influence over the various nerves of the body, particularly over the pneumogastric nerves. If these nerves are divided by artificial means, the identical symptoms of cholera are produced.]

In the Appendix to the Report of the Committee for Scientific Inquiries in relation to the Cholera epidemic, 1854, Table XXXVII., showing the electricity of the atmosphere at the several stations, is most interesting, and affords a great field for further study and observation. I maintain that it is the negative electricity that acts on the sympathetic brain and spine, and produces cholera. On turning to page 103 of the same Report, I find a passage which strongly bears me out—viz., "I much regret that the electrometer observations began too late to afford any decided results. They would, however, seem to show that a deficiency of electricity prevailed during the time when the disease was at its height, and that at low stations, as compared with higher, a deficiency was likewise to be observed, which fully accounts for the prevalence of cholera in low districts."

There are two forms of this direful malady : Cholera Mitior, analogous to English cholera; and Cholera Asphyxia, or suffocative cho-

lera, the latter being the most dangerous. Complete paralysis or suspension of the brain's influence over the various nerves of the body, particularly of the pneumogastric nerves, exists in this special form of the disease. The lungs do not perform their proper functions; the vitality of the blood is not maintained; consequently the duration of the disease depends upon the complete or incomplete paralysis of these nerves.

While, in certain localities, the electrical condition of the earth and atmosphere is *predisposing* only, the immediately *exciting* causes are many and various, effluvia being amongst the most prominent; 2nd, excesses of any kind; 3rd, evaporation arising from damp floors, cesspools, &c.; 4th, purgatives taken for some other complaint. I cannot give a better example of immunity from the cholera epidemic than the Newcastle Garrison when I was in charge, and I attribute it solely to guarding the soldiers against the exciting causes, and, by a strict surveillance over their habits, doing away with effluvia; and cautioning them against the danger of not making immediate application on the appearance of diarrhœa.

The first symptoms are vomiting and purging—exactly what takes place when the brain is injured; but I have frequently noticed that patients generally complain of a tightness of the chest, sometimes amounting to pain, with a difficulty of respiration, and occasionally uneasy sensations in the head previous to these; after which come cramp, loss of voice, &c. &c.

Having briefly stated what the predisposing and exciting causes are, I beg to add a few observations, as well as my experience, relative to its *treatment*. What can this be, in a disease in which the door to medication is in most instances closed by the early paralysis of the gastric nerves? The physician must have recourse to a remedy possessing an instantaneous effect over the brain and nerves. Now, every one knows the effect of an emetic, acting directly on the brain exciting a more vigorous action of the powers of the constitution, as is proved by the amendment of the pulse, and other favourable appearances, immediately after vomiting. Although produced by debility of the brain in the first instance, it has the effect of reflecting strength back on the constitution.

This is the groundwork of my treatment in every stage of cholera: —First begin with an emetic, followed (after the action of the emetic has ceased) by an opiate—say thirty to forty minims of tincture of opium, and thirty minims of sulphuric ether, to two ounces of water. If this does not rest on the stomach, a pill, composed of three grains of calomel and one grain of opium, is to be given. This will often remain on the stomach when nothing else will. But what is to be done in collapse, when the pulse is small and thready, respiration almost suspended, and lividity pervading the whole system (the circulation being impeded owing to the contracted state of the lungs)? Chloroform is the grand remedy. But how does it act, or how should

it be administered? It is given by inhalation, carefully marking or watching the effect upon the pulse. Now, the first effect of chloroform is a strong stimulant, the pulse becoming full and bounding, where before its use it could hardly be felt. You must prolong its application as long as the pulse is full, and the moment it begins to sink, withdraw the chloroform; alternately repeating and withdrawing the stimulant until the patient lapses off to sleep. I may also add, that in a case of incessant vomiting, where nothing will remain on the stomach, a full opiate, say thirty or forty minims of tincture of opium in combination with half a drachm of ether, may be given in a little water, and then the chloroform administered, which instantly checks the vomiting; and this action being kept up, the opiate becomes absorbed, and sleep very soon follows.

This I maintain is a *new treatment*, and one which I invariably adopted during the cholera epidemic at Varna (where I was in charge of her Majesty's 6th Dragoons), and with such success, as the medical return will show (vide "Army Medical Board Returns"), that out of 62 cases of genuine Asiatic cholera, I only lost nine patients (about 14 per cent.) I will illustrate this treatment by giving a few cases:

Private ——, 6th Dragoons, was attacked in the night with severe diarrhœa, quickly followed by vomiting, great mental depression, &c. Did not make any application to the medical officer until the next day. On the morning following his attack his comrades gave him brandy, pepper, &c. He allowed the disease to go on until the evening, when my hospital sergeant heard that he was ill, and reported the case to me. I visited the man's tent, which was a small one, pitched at the back of his master's ball-tent, only a few yards intervening. I found him in a state of extreme collapse, lividity pervading his whole system; incessant vomiting, with frequent diarrhœa, and pulse not to be felt. I ordered him to hospital instantly, administered a mustard emetic, which had the desired effect, and then applied the chloroform, having first given him a full opiate in conjunction with a stimulant. The pulse, which at first appeared small and thread-like, gradually became larger, stronger, and fuller. I kept up the action of the chloroform until the pulse began to diminish, and then withdrew it, again to repeat it after a short interval. The vomiting and diarrhœa ceased, and sleep followed. The patient remained asleep for about four hours, and awoke complaining of great thirst, which I have invariably remarked in all cases of cholera. I always kept a large quantity of solution of bicarbonate of soda with a little ginger, which I think makes the nearest approach to the saline ingredients of the blood, the ginger being merely to stimulate and warm the stomach and intestinal canal, &c. This I allowed the patient to partake of freely. He had slight consecutive fever, but was quite recovered and at his duty on the sixth day.

Sergeant ——, 6th Dragoons; admitted into hospital, complaining of uneasy sensations in the head, slight pain, or tightness of the chest,

as he termed it; vomited frequently during my examination of him; stated that he had suffered from diarrhœa the greater part of the night; great mental depression; pupils much dilated; pulse very small, and with difficulty could be felt; in fact, the usual symptoms that characterize this hitherto formidable disease. Ordered, a mustard emetic; as soon as the action of the emetic ceased, a full opiate, with ether, in a little water. Vomiting and diarrhœa ceased, and sleep followed. At his duty on the third day.

Sergeant Major ——, 6th Dragoons (treated in his tent); was attacked with diarrhœa in the middle of the night, quickly followed by vomiting; stated he drank a good deal of native wine (sheerah) on the previous evening. This was a good example of excess as an exciting cause. His countenance was shrunken and nearly livid; voice scarcely audible; pulse hardly to be felt. A mustard emetic was administered, which did not act for some time, but when it did, it was effectual, a large quantity of bilious secretion coming away. A full opiate, with sulphuric ether, was administered, and immediately followed by the inhalation of the chloroform, to prevent the rejection of the opiate and stimulant. The pulse rose full and bounding, lividity disappeared, and I had the gratification to find my patient in a slumber after a few minutes. Ultimately he did well, and was quite restored to health in a few days. I could add several other cases, more or less severe than these, but I think it would be superfluous.

I did not take any notes of the number of *diarrhœal* cases, which were very frequent; as many as fifty or sixty patients (in my regiment) made application daily to hospital for medicine to check this disease. The most successful formula I found to stay it was a mixture composed of the following ingredients:—Prepared chalk, aromatic confection, tincture of catechu, tincture of kino, gum Arabic mucilage, tincture of opium, distilled water. Also a pill composed of three grains of calomel, one grain of opium, and one grain of aromatic confection.

These were the formulæ which I also used at Newcastle-on-Tyne in 1853, when there were nearly 500 cases of diarrhœa admitted into hospital, and not a single death. Compare this with the report of the London hospitals in 1854, and truth will speak for itself.

In Dr. Babington's Report of the Cholera amongst the Black Sea Fleet, furnished to the Board of Health, a great deal of ingenuity is shown, but, alas! after comparing the reports of almost all the medical officers of the Black Sea Fleet, he concludes thus:—"But no measure of success seems to have followed any mode of treatment, so as to recommend it emphatically beyond the rest." Some of the suggestions in Dr. Babington's compilation are, he states, very valuable, and it affords much food for reflection on a disease, the nature of which remains so obscure.

In putting these few notes together, I have carefully avoided enlarging this little treatise, or adding any superfluous matter, thereby

making it easily comprehended. Already the symptoms are, I am confident, but too evident to those who ever once saw cholera; and, besides, they are so elaborately described by so many authors. My object is merely to introduce a *new treatment* for this hitherto formidable disease, and which has been so far successful, that I deem it but right to make it known for humanity's sake.

I think a great deal of useful information may yet be derived from carefully-made observations with the electrometer at *night*, for invariably every case of cholera that I had to deal with in my extensive field of practice occurred between twelve and three o'clock at night. Not having an electrometer in my possession, either at Newcastle-on-Tyne or at Varna, in Turkey, I made no observations.

Composition of chloroform: C_2 H Cl_3 It is improperly called a a *terchloride* of formyl, its real composition being as I have stated above. Its action is *stimulant*, *sedative*, and *anti-spasmodic*, the identical three objects essentially necessary to recover a cholera patient.

[Mr. E. C. Willis, of Plumstead, in a letter to the 'Lancet,' observes, that there are, in the preceding able paper by Mr. Boate, certain points open to objection.]

"Mr. Boate says that cholera originates in a suspension of the powers of the par vagum, owing to the effect which a deficiency in the elasticity of the earth and atmosphere produces on the cerebro-spinal ganglia. That such a deficiency really universally exists when the disease is present, he has yet to show; that, if existing, it is sufficient to produce cholera, he has yet to prove; and he has also to make his theory consistent with the known peculiarities of the cause of this malady, its method of travelling slowly, but surely, in definite directions, and the phenomena which attend its aggression.

"But with regard to his assertions concerning the paralysis of the pneumogastrics, I submit that he is in error. Section of these nerves will not produce symptoms of cholera. Vomiting may take place, but this is by no means an invariable symptom, and, when it does occur, is owing to the irritation produced by the operation, and passes off, so that after a time the animal will take food, and even digest it, as is shown in Dr. Reid's experiments. I have divided the pneumogastrics myself, and neither vomiting nor purging followed, nor at first was there any apparent discomfort beyond what might have been expected from an operation of any kind. The pneumogastrics, as regards their relation to the alimentary canal, are motor nerves of the œsophagus and stomach, and, if they have any connexion with the mucous membrane also, at all events their paralysis does not primarily interfere with digestion. It is their irritation, not their paralysis, that occasions the vomiting and other symptoms which they assist in producing, both in cholera and in various other diseases. Such irritation may be due to centric or eccentric disturbance of the cerebro-spinal functions, and in either case the pectoral symptoms referred to by Mr. Boate might be present.

"The exciting causes mentioned will induce irritation of the vagi, without the existence of any predisposing electrical condition in the earth or atmosphere. Vomiting and purging follow the inhalation of any noxious exhalation, the introduction of an improper ingestum, or anything which offends the organic system, just as they do a blow on the head or any other direct injury to the brain and spine.

"With regard to the comparison which Mr. Boate draws between his own success in the treatment of diarrhœa and that of the London hospitals, I do not think he takes into account the different class of patients with whom he has to deal. Soldiers under strict military discipline, duly cautioned, and almost obliged, to report themselves as soon as the first symptoms make their appearance, are scarcely to be brought in opposition to the worn-out, and in many instances half-fed, mechanics of the metropolis, who, with their wives and children, often seek assistance only when the time for help has passed and the powers of life are failing."—*Lancet, Aug.* 8 *and* 22, 1857, *pp.* 136, 200.

36.—REPORT OF A CASE OF ASIATIC CHOLERA.

By Dr. Henry Madge, London.

On Wednesday, August 12th, I was called to a gentleman in Gower-street, who had the following symptoms:—Complete prostration, speaking in a whisper; violent cramps, particularly in the feet, legs, and abdomen; finger-nails purple, and the skin of the fingers shrivelled and cold, like those of a dead subject; the arms, legs, and feet were also quite cold; the eyes were dimmed and sunken, and, as there was labouring for breath, the face wore a most anxious expression; pulse feeble and irregular, with sickness and profuse evacuations of rice-water stools. The patient was evidently sinking from an attack of real Asiatic cholera. I immediately ordered hot water to the feet, warm flannels to the legs and arms, placed a large mustard poultice over the whole abdominal region, administered stimulants, and prescribed the following mixture:—Acetate of lead, fifteen grains; acetic acid, half a drachm; tincture of opium, half a drachm; tincture of capsicum, eight minims; and peppermint-water to six ounces; two tablespoonfuls to be taken immediately.

On calling again, in an hour, I met Mr. Weekes, of Bloomsbury, the regular medical attendant, and we had the satisfaction of finding that the mixture had kept down, and that, although previously the evacuations had been constant, they appeared now to have ceased. The other symptoms had undergone no material change: the patient's whispers were scarcely audible, tongue dry and furred, urine high-coloured, and in small dribbling quantities. The mixture was ordered to be taken every hour; we also ordered iced water to allay thirst, port-wine, and the constant application of warmth to the extremities. In the evening, reaction had commenced; pulse quick, but still weak

and irregular; returning warmth; slight sickness, but no diarrhœa; cramps in feet and legs still severe. The above treatment was persevered in during the night.

The next day, August 13th, we found reaction perfectly established; voice still husky and indistinct: cramps in legs troublesome; pulse improved, tongue furred and accompanied with considerable thirst. Mixture to be taken less frequently, and iced water more freely. Late in the day a copious dark watery stool came away, having the appearance of discoloured rice-water, which may probably have been owing to the action of disengaged gas on the lead taken into the system. Mixture to be taken at shorter intervals.

Aug. 14th. Has had a good night; perspired profusely; no diarrhœa; tongue still coated, but moist; pulse almost natural; passed a little more urine; ominous rumbling sounds in the intestinal canal, but without pain. Ordered beef-tea and moderate quantities of port-wine with arrowroot; a dose of the mixture at night, to be repeated, if necessary.

15th. Improved in every respect; bowels have not acted. To discontinue the mixture. Ordered mercury with chalk at bed-time.

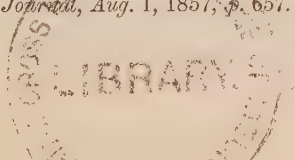
16th. Continues to improve. Bowels not having acted, ordered castor oil.

17th. Quite convalescent; feels weak, but able to get up and walk about. The castor oil has acted three times; stools dark, bilious, and partially firm; appetite returning. Ordered quinine mixture. and a little carefully got-up meat diet.

As the object of publishing cases of this kind is to draw from them practical deductions, I should be glad to be permitted to offer one or two remarks. The mixture I employed in this case, and which acted so admirably, was recommended to me by a practitioner in 1854. I then held an appointment under the Local Board of Health, and besides several hundred cases of diarrhœa and choleraic diarrhœa, I treated several severe cases of genuine cholera. Six of the number terminated fatally, but in the majority of them I proved the efficacy of the means employed in this case. There was one extreme case, at the bottom of Rathbone-place, which two medical men and others will well remember yielded to the same treatment; not, however, before I was fortunate enough to subdue a violent sickness by giving creosote. As an astringent, the plumbi acetas seem to act quicker and better in solution than in pills, and it is an advantage to be able to combine with it the tincture of capsicum, which certainly seems to stimulate and comfort the patient, whilst it assists the opium in relieving painful spasms. In 1839 I attended cases of cholera at Bow, and was in the habit of giving calomel. After that fearful visitation had passed away, on reviewing my cases, I entertained the opinion that calomel was injurious: my subsequent experience has only tended to confirm this opinion. To me, it has appeared to add to the depression of the patient at a time when he requires to be supported and even stimu-

lated; and from its well-known effects in other cases, it must necessarily keep up the excessive irritation in the mucous coat of the intestines, and the consequent serous effusion which helps to kill the patient. In the opportunities I have had (many of them at Guy's) of seeing post-mortem examinations in cases of cholera, the gall-bladder has invariably been found distended with bile. It appears to have been prevented from emptying itself into the usual channel by a spasmodic closure of its neck, or from the ductus communis and its connexions partaking of the general spasm affecting the system. If this is the case, what good can calomel do? The liver does not want stimulating—there is already an abundance of bile. Is it not better, in collapse, and in the dangerous stages of the disease, to trust to stimulants, astringents, and antispasmodics? The latter will bring about what is supposed to be the effect of mercury in such cases—the passage of bile. When the severe symptoms are over, the internal organs having passed through a state of congestion, a mild mercurial appears to be advisable, and, as in the foregoing case, will probably act well. Of course there will be differences of opinion on these views; but the case I have related will serve to show, first, that our old enemy the cholera is amongst us; and secondly, that in a very severe form, in the stage of collapse, it has been met and treated successfully.—*Lancet, Aug.* 22, 1857, *p.* 190.

37.—*A new Promonitory Symptom in Cholera.*—The Academy of Sciences has received from Dr. Poznanski an important communication, in which it is stated—1. That during the prevalence of cholera it frequently happens that the pulse is extremely low, and reduced to 45 or even 42 in persons apparently in perfect health. 2. That this symptom is unaccompanied by any other denoting a morbid state. 3. That when the pulse is low, the blood becomes dark and viscous; while in persons whose pulse is in a normal state during the epidemic, the pulse is perfectly healthy. 4. The cholera only attacks those that have previously experienced a diminution in their pulse. 5. That this diminution, which often occurs weeks before the regular attack, may be considered a pathognomonic symptom of the approach of cholera. 6. That those who have experienced the diminution in question had always escaped the disease whenever they have followed a regimen calculated to accelerate the circulation. 7. That the falling off of the pulse, and therefore the predisposition to the disease, are in general proportional to the want of energy in the circulation of the blood and to the excess of atmospheric pressure. 8. That this diminution does not occur in healthy subjects when the epidemic has ceased.—*British Med. Journal, Aug.* 1, 1857, *p.* 657.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DISEASES OF THE URINARY ORGANS.

38.—ON THE NATURE AND ORIGIN OF RENAL DISEASE.

By Dr. J. Russell, Lecturer on Pathology at Sydenham College, Birmingham, and formerly Senior Physician to the Birmingham General Dispensary.

[The author, in the following remarks, confines himself to that group of diseases characterized by the presence of albumen in the urine, by a serious diminution in the daily excretions of urinary salts, and by the passage from the kidney of certain peculiar casts; together with a tendency to the effusion of anasarcous fluid into the cellular tissue of the body.]

In discussing this subject, the first inquiry must relate to those morbid changes in the kidneys which constitute the disease. These have been recently described by Dr. George Johnson, in his work on 'Diseases of the Kidney.' The *primary* changes vary in the different forms of the disease; in one form, the epithelial cells, which perform the function of secretion, are shrivelled and broken up, and the uriniferous tubules are, in consequence, either shrunk and wasted, or, being bared of their epithelial lining, are dilated to various degrees: in another form of the disease, the place of the cells is occupied by a homogeneous material, apparently of a fibrinous character: and in a third, to which the name of Bright's disease is sometimes restricted, these epithelial cells either remain loaded with fat, or, having been ruptured by excessive distension, fill the tubules with their oily contents. These primary changes are speedily followed by others, both in the tissues of the kidney itself, and in other organs of the body; but such changes, being of a *secondary* nature, do not concern our present inquiry.

The structural changes I have thus briefly indicated have one important character in common, which has a special bearing upon the opinion I shall suggest as to their nature and origin, viz., that they all commence in the *secreting instruments* of the kidney, the glandular epithelial cells which line the convoluted tubules; it is the *cortical portion* of the organ which receives the stress of the disease; the straight tubes which constitute the medullary portion, and which are little besides ducts, are affected to a much less extent, and often escape altogether. Further, it is important to observe that the changes in question are degenerative in their character, and in this respect are directly opposed to that creation of additional secreting tissue which constitutes true hypertrophy of the kidney, and which occurs in the course of the natural effort made by a *healthy* kidney to do double work, when its fellow is disabled by injury or disease; they thus satisfactorily agree with the prominent symptom of the disease—namely, the lessened amount of salts secreted in the urine.

The explanation of these various structural changes, which is given by Dr. Johnson, and to which I now wish to direct attention, is the following. The morbid changes take their origin in alteration of function in the parts diseased, viz., in the epithelial cells. In consequence of exposure to unhealthy influences of various kinds, the nutrition of the blood becomes depraved, and that fluid becomes loaded with unhealthy matters, which must be eliminated from the body; the labour of effecting this is thrown, in great measure, upon the kidneys, and materials of an unhealthy character are thus being continually brought for excretion to the cells of those organs; consequently, the function of the cells becomes perverted; their natural food, the excreta, is changed. As a necessary result their nutrition becomes impaired, and morbid alterations of structure are induced. Such alterations may be effected gradually, almost insensibly, if the corresponding change of function be induced gradually; on the other hand, if the work of the organ be suddenly changed, the alteration of kidney structure will be attended by a relative commotion in the organ itself, and secondarily, in the system at large. By what singular modification in the operation of the causes the different forms of the disease are produced, we are just as ignorant as we are of the causes which determine fatty degeneration in an organ at one time, wasting at another, and calcareous transformation at another. Much, no doubt, is due to the original constitution of the patient. Thus, one variety is most frequently met with in the strumous constitution.

Dr. Johnson's explanation of the disease seems to me to be supported by the great pathological law, that in every organ and tissue nutrition follows function, is related to it, and regulated by it; and I think it derives support, not only from the history of the patient's life and habits, and from the nature of the influences which seem to stand to the disease in the relation of cause, but also from the analogy of corresponding changes in other organs of the body. I shall beg leave to submit a few arguments of each class.

First, I will refer to the arguments derived from the analogy of other organs. Until lately, inflammation has been constantly referred to as the one important source in which most of the changes of structure, with which we are familiar, take their rise: and we now most naturally look for traces of this process in explaining any disease which falls under our observation. Late researches, however, have revealed to us a very large number of organic changes, which are entirely independent of inflammation. The large class of hypertrophies, properly so called—those, namely, in which the enlargement is entirely due to increase in the natural tissue of an organ—exhibit to us instances of large increase of dimension and weight, without any inflammation having been concerned in the process. On the other hand, in the class of atrophies, there is equal change in the opposite direction: and, although inflammation, like any other influence which depraves nutrition, may produce atrophy, yet, in a vast

majority of instances, the change has been entirely independent of that process.

But it may be said, there is no alteration of structure in the instances cited; nothing but augmented or diminished bulk. Look, then, at the still larger class of degenerations; here are found muscular, arterial, cartilaginous, osseous, fibrous, and other tissues transmuted entirely into fat or earthy matter, or withered into mere fibrocellular tissue, and yet inflammation has had no part in the matter. Look again at cancerous and tubercular formations, and at the non-malignant tumours; what numberless examples of extensive structural change, independent of inflammation, do they afford. And yet there is hardly one of the changes to which I have alluded which has not afforded, at one time or other, a battle-field for the question, of how far inflammation has been concerned in its production:—the contest relating to the origin of tubercle, and of the atheroma of arteries, whether or not it is connected with inflammation, is one of our own day.

Since we have discarded the inflammatory origin of these and similar changes, it is a necessary question, in what do they originate? where is their starting point? I think it will not be doubted that in a large majority of the instances I have quoted, the first step in the process of change is connected with the *function* of the organ itself. In the hypertrophied heart, the first in the series of changes is a demand made upon the organ for increased exertion, in consequence of some obstacle retarding the onward current of the blood; just as conception takes place *before* the natural increase of the womb in pregnancy commences, thereby creating fresh demand on the nutrition of that organ. On the other hand, in the old woman we find the ovaries atrophied, in the palsied limb we find the muscles wasted or degenerated; here again the first step has been a change in the function of the organ affected, an abrogation or serious diminution of that particular function, just as in the womb lessened requirement, consequent upon delivery, precedes the shrinking which follows that event.

Perhaps the most striking exemplification of this waiting of nutrition upon function, is afforded by the changes which are gradually effected in the tissue of every organ during the period of decline from manhood to old age; as the time for mental and bodily activity passes away, the standard of nutrition in the entire body is lowered, and every form of degenerative change may be met with in the various tissues of the body. The great tendency of our present pathology to explain change of structure by previous alteration of function is exemplified in the hypothesis concerning the nature of cancer, now most in favour:—that the cells of which cancerous tumours are made up are designed to eliminate from the blood, in the way of secretion, some peculiar matter injurious to the system, which generates the well known cancerous cachexia. This, though only a hypothesis, indicates the present course of opinion in pathology.

One more illustration I am tempted to add, as being more immediately connected with the subject in hand; I refer to the deteriorating influence which is exerted upon the nutrition of any organ, by an *unhealthy* demand made upon it for exertion. Let the hypertrophied heart be over-taxed, and nutrition fails any longer to answer the demand: let the bodily frame be subjected to a long-continued and excessive demand upon its energy, and in place of the healthy increase in nutrition which work in moderation excites, there is actual wasting, a state of cachexia; and similarly, to an over-taxed brain must be referred a long list of serious nervous diseases.

In the various cases I have now cited it is to the function of the organ chiefly concerned, that we direct the largest part of our attention, in endeavouring to cure the disease: in like manner, if the same explanation be correctly applied to the degenerations in the kidney cells which exist in Bright's disease, it must be our business, whether for prevention or for cure, to pay attention first to keeping the function of the organ in a healthy state, by removing those various causes which impose excessive or unnatural labour upon the secreting cells.

But here another question presents itself; it cannot be denied that certain forms of renal disease set in with every symptom of active congestion, if not of acute inflammation, such symptoms being present from the very beginning: this is the case in what is commonly called acute dropsy; and even in the chronic form, acute congestion may be readily excited by very trifling causes. Such being the case, it becomes incumbent upon those who deny the inflammatory origin of these diseases, to explain their relation to this state of vascular excitement. This relation we are in a better position to understand at the present day, when the near connection which undoubtedly exists between inflammation and the ordinary processes of nutrition, is beginning to be perceived. Formerly, when our attention was fixed too exclusively upon the prominent symptoms of inflammation, the vascular turgescence, and the effused fluids, we were in the habit of regarding inflammation as a disease quite *sui generis;* we had neglected to observe that in the perfectly natural course of things, wonderful variations in the degree of vascular activity are being continually produced; we had forgotten that lymph, in no respect distinguishable from the product of inflammation, is poured out in the quiet process of the repair of wounds and fractures. In these and other effects we now perceive how nearly inflammation is related to nutrition, although it must confessed that very much yet remains to be done before the exact nature of this relation is full understood.

These remarks will find their application in the active congestions which are not unfrequently associated, at some time or other, with diseases of the kidney. The blood-vessels are the great agents in nutrition: in this respect they are second only to the proper vital action of the tissues themselves; but sound pathology requires it to be

remembered that the vessels do hold the second, and not the first place, as was at one time the belief. The whole subject of cell development has placed in its correct position the relation held by the blood-vessels to every process of nutrition: for in watching the healing of a wound, for instance, we find progress effected in the transformation of the cells in the effused lymph, before any vessels have made their appearance: and in the embryo the blood is by no means the earliest tissue developed.

This secondary, but still most intimate relation of the blood-vessels to the tissues, affords means of rendering a satisfactory explanation of many cases of active congestion and inflammation, an explanation, too, which I think may be correctly applied to the case of the kidneys; for it must follow that no change can by possibility be effected in the nutrition of any organ or tissue without inducing, as a necessary consequence, a corresponding change in the circulation of the part. Determination of blood to the womb is set up as soon as the process of increased growth, or natural hypertrophy, which is instituted by conception, commences; determination to the neighbourhood of a wound is established as soon as the process of granulation has fairly begun. So long as the demand, in obedience to which this determination of blood takes place, is within the limits of health, the excitement of the blood-vessels, though often considerable, is in perfect agreement with the normal course of nutrition; but such is not the case when the stimulus is carried beyond this point. When the infant is put to the breast, the distended veins give intimation of the increase which immediately takes place in the rush of blood, with the obvious intent of furnishing matter for the secretion of milk; but if the natural stimulus excited by the contact of the child's lips with the nipple be exaggerated by a crack or excoriation, the determination of blood runs on to inflammation: in the same manner, in any secreting organ, in the mucous membrane of the bowels, for instance, a moderate purgative increases the intestinal secretions, but a drastic purge gives rise to congestion, possibly to inflammation, with transudation of the constituent elements of the blood; or, to bring the analogy still nearer to our present subject, a large dose of a diuretic, and particularly of the stronger ones, will be followed by congestion of the kidney. Now, in all of these cases the organ is stated to have been over-stimulated; speaking more accurately, the congestion is brought on by an excessive amount of the self-same stimulus, which, in a moderate degree, had simply produced healthy rush of blood, by quickening the healthy function to a state of greater activity.

There is also another influence in operation in many stages of renal disease, which equally tends to the production of congestion. We know that an intimate relation exists between the blood and the capillary vessels of every organ, although we are not able to explain this relation. Natural variations in the circulation of different organs

are entirely inexplicable by the mere impulse of the heart. How otherwise could we account for the necessary determination of blood to the womb only at certain particular periods of the individual's life? How could we explain the rush to a secreting organ to supply the material of secretion? This relation is special to every organ, and upon its maintenance freedom of circulation through each organ mainly depends; therefore, when it is disturbed in any way, stagnation of blood or congestion must follow. The phenomena of asphyxia afford a very good illustration of this fact. The admission of air to the lungs being cut off, the blood in the capillaries of the lungs can no longer be aerated; consequently, the relation which this blood ought to bear to those capillaries is altered, and arrest of the capillary circulation is the consequence, as evidenced by the loaded pulmonary artery and right side of the heart, contrasted with the empty condition of the pulmonary veins.

The same cause which operates in asphyxia, impurity of blood, operates also in disease of the kidney, and must naturally tend to increase the difficulty of the circulation through their substance; and this cause has produced a very interesting secondary change, pointed out by Dr. Johnson—namely, hypertrophy of the small arteries—such hypertrophy constituting as evident a measure of retarded circulation in the particular organ, as hypertrophy of the heart does of the obstacle presented by a narrowed orifice.

From the analogies which I have now submitted to consideration, I think I am allowed to conclude that alterations of function in any organ have a natural tendency to induce alterations of structure, varying more and more widely, according to the extent to which the function is forced to deviate from the limits of health; also that such alterations of structure may be effected either with or without vascular excitement; but that, when the vascular excitement is present, it very often exists as a secondary result. How far this conclusion extends, we are yet ignorant; we are only just beginning to understand the phenomena of inflammation, and although we can now discover their origin in the cause I have been particularly referring to, this explanation can only apply to a very limited number of cases; it is, however, if true, of the highest value, as affording a safe position from which to start in investigating those forms of inflammation which are yet so little understood.

I must, however, add, that when once this vascular excitement has been established, it may come to play a prominent part in the case; being itself the product of an unnatural state, and being, therefore, in itself unnatural, it may easily proceed to extreme lengths; it may even absorb the principal share of our attention, and require special and active treatment; but still such treatment must be conducted with a constant reference to the function, in the disorder of which the vascular excitement originated. An obvious illustration is afforded by our treatment of acute dropsy, whether after scarlatina, or expo-

sure to cold, or from any other cause; we are often obliged to employ active antiphlogistic treatment, as cupping, leeches, counter-irritation, &c.; but at the same time we remember the origin of the congestion in disordered function of the kidney, and we immediately endeavour to ease the labouring organ through the medium of the skin and of the bowels; indeed, the latter branch of the treatment may not unfrequently render the former either entirely unnecessary, or required to a much less extent.

It only remains that I justify the assertion, that the condition of the kidneys, in patients who are suffering from the disease in question, is such as to have involved an unnatural state of their function. Such justification must be gained from the history of the patients. I think I may safely assert, that whenever a cause has been fairly made out, it is such as must bear directly upon the function of the kidneys; thus in the forms of acute dropsy, the sudden suppression of the cutaneous, and possibly in some cases, of other secretions, makes a sudden and unnatural demand upon the kidneys. In cases of scarlatina, of cholera, of typhus, we have the element of sudden admixture of poison with the blood, in addition, in many cases at least, to unfavourable influences acting upon the skin; disorder of the urinary functions, active congestion and its attendants, are the result; and a rapid and irregular development of epithelial cells, as manifested by the urine during life, and by the kidney after death, affords visible testimony to the labour in which the organ is engaged. More frequently the cause appears of such a nature as to act gradually, but to maintain its action through a long duration of time; the gouty diathesis and habitual intemperance constitute, perhaps, the most frequent causes of chronic renal disease, of the class we are considering; here the relation to the kidneys is also distinct; the poison of gout is either itself lithic acid, or is closely allied to that substance, and alcohol also has a direct affinity for the kidney, acting as a diuretic, and being actually capable of detection in the urine.

I shall not detain you whilst I enumerate other unfavourable influences which seem to act as causes: various unhealthy modes of life, different forms of cachexia, particularly the strumous, and of blood poisoning, &c.; like those to which I have already alluded, they variously derange the constitution of the blood, either by directly introducing unhealthy matters, or no doubt more frequently by altering its nutritive changes; in some of these instances, we have to depend upon analogy for explaining the operation of the supposed cause.

I ought not to omit to add, that in explaining the operation of these various causes, we have generally to take into the account those various circumstances which predispose the organs to take on disease; without these having existed previously, many of the morbific influences we have alluded to would often fail in effecting so serious a disorder of function.

It is matter of easy observation that the cells of the kidney tubes

are exceedingly sensitive to all unhealthy states of the general system; in various forms of cachexia, in chronic disease, in complaints which originate in poisoned blood, such as the fevers, pyæmia, &c., the microscope readily detects very visible changes in the kidney epithelium, even though there have been no signs of disorder in the organs during life. In these appearances, which a small amount of microscopic experience will enable any one to verify for himself, we see perhaps the very commencement of organic change, and we can readily conceive that if the unfavourable condition, in which these appearances have originated, should act more powerfully at any time, permanent changes in these delicate organs would be the result.

In conclusion, I can only make a passing reference to the analogy presented by the liver in its diseases. In certain of the structural changes to which that organ is subject, we recognise great resemblance to those which take place in the kidney; and this resemblance becomes closer in exact proportion as we discover more of the nature and operation of the causes of liver disease.—*British Med. Journal, May* 2, 1857, *p.* 359.

39.—ON THE URIC, OXALIC, AND SACCHARINE DIATHESES.

By Dr. G. Owen Rees, F.R.S., Physician to Guy's Hospital.

[The changes which occur in urine after secretion, and before expulsion from the body, and which changes occur as the result of local actions in the tubes and receptacles through which it passes, is a point which has hitherto been sadly overlooked.]

In the lectures I had the honour to deliver last year, I made the statement, that, were it not for the uric acid diathesis, urinary calculus would be as rare a disease as tetanus, and I traced the existence of oxalate of lime and of the earthy phosphates in the urine, or as constituents of calculi, to changes effected after secretion. I showed how urine containing the urates was convertible, out of the body (by the application of an increased temperature), into urine containing a deposit of oxalate of lime, and I adduced facts and arguments showing that the presence either of uric acid or the oxalate of lime in the urinary canals would lead to inflammation of the mucous surfaces and the consequent effusion of an alkaline fluid, and that this would cause a precipitation of the earthy phosphates. All these evils were regarded as dependent, so far as the secreted urine was concerned, on the presence of an excessive quantity of uric acid or of an urate in the blood, and therefore on the *uric* diathesis, notwithstanding that the urine, as evacuated, and after passing over the mucous surfaces, might deposit *oxalate of lime or earthy phosphates.* The oxalic and the phosphatic diatheses were ignored, the uric acid diathesis being the only one recognised.

It is obvious that if the above be true, an entirely new view of treatment must be taken. The kidney, in fact, must be regarded as always secreting an acid urine, unless ingesta (in the form of food or medicine) be given to change its character.

An utter neglect of the pathology of the urinary mucous membrane has led to all the perplexity in which the question of phosphatic disease has become involved. The experiment I made in the case of a patient with deficient anterior abdominal parietes, as detailed in former lectures, showed how easily the secreted urine had its acidity neutralized, as it flowed from the ureter over an inflamed mucous surface. The crucial experiment also detailed, of causing a patient who was passing alkaline urine, to pass urine of acid reaction, by administering alkalies, is, again, quite conclusive as to the mucous surfaces being in fault, and as to their possessing the power of changing acid urine to alkalinity when in an inflamed state. Let us follow this change, and describe the therapeutical action of alkaline treatment. We will suppose we have (as I have often had) a patient afflicted with the uric acid diathesis. He tells you his history: how he passed red sand in quantity, and perhaps a small calculus escaped from his kidney and found its way through the urethra. This state of things, after a time, he may say, changed. He began occasionally to pass *alkaline urine* and the *phosphates*. Sometimes during the same day he will tell you he has passed both red sand and the phosphates. Old sufferers have more than once brought me specimens of such deposits. He may tell you his urine next became almost constantly alkaline: that acids in every form were administered, in order to obviate this, but that he has gone on from bad to worse. The bladder you will find is now involved, and if he have no calculus there, it is not the fault of those who have prescribed acid treatment.

Now here we have a man passing an alkaline urine; there is phosphatic deposit, and two views may be taken of his case—the one, that long disease has caused the phosphatic diathesis to appear, and that the urine is secreted alkaline by the kidney; the other view being, that the uric acid diathesis is still present, and that the mucous surfaces have become inflamed, and are neutralizing, by their secretion, every drop of urine, and thus the phosphates are precipitated. According to the first view, an acid plan of treatment might be beneficial; according to the second, alkalies are indicated.

Let us put the case to proof. We give small doses of citrate of potash. These are to be carefully administered, and as the case improves, the dose is to be lessened. During this treatment, the urine still continues alkaline, but the earthy phosphates appear in less quantity. They are gradually being held in solution by the bicarbonate of potash which exists in the urine, owing to the destruction of the citrate in the system. The urine is now secreted of alkaline reaction, and the inflamed mucous surfaces being no longer irritated by an acid fluid, gradually recover themselves, and eventually cease to pour out

their alkaline liquor, and we obtain from the urethra the healthy and acid secretion of the kidney. There is no conceivable theory bearing reference to the phosphatic diathesis of Prout and his followers which can explain this result.

The existence of an uric acid diathesis is a matter now proved—that is to say, we have satisfactorily established the presence of a state of system in which uric acid and its combinations appear in the blood in abnormal quantity. This, which was long matter of belief, has been clearly demonstrated by the experiments of Dr. Garrod; and to the presence of uric acid in the blood I believe we may trace nearly all the evils to which calculous subjects are liable, for those constituents of urinary calculi and of urinary deposits, which do not admit of being traced up to its presence, are extremely rare—viz., cystine, silica, uric oxide, &c. Regarding diathesis as expressive of a power or force predisposing the organism to some especial form of disease, I propose next to consider a state of urine which has been considered indicative of a diathesis, but which, I believe, bears no relation whatever to an especial disease, but is produced by many. In every case, however, it has reference to one and the same action taking place in the organism—viz., emaciation. Writers have described the excretion of an excess of urea as an urinary disease, as an affection not necessarily connected with any organ or organs of the body, but having reference to a peculiar state of system not of necessity engrafted on any organic affection capable of detection by physical examination or by symptomatology. According to this view, in fact, the urine containing an excess of urea is the disease, and the therapeutical considerations are to follow without further inquiry. Such has been the practice in these cases, and the patient has had the gratification of knowing he suffers from azoturia, or excess of nitrogeneous matter in the urine. With this he of course connects no idea whatever, nor is it desirable he should; but the misfortune is, that the profession have had quite as little acquaintance with the subject as the patients, which is also not very desirable.

It is now some years since I first had my attention directed to these cases. By degrees I learned how extremely rare this diseased state of urine was in anything like an excessive form. The cases I saw, it is true, yielded an urine of high specific gravity, and very rich in urea; and I found a state of debility which might or might not be removed by remedies, and in the one case that the urine improved, and in the other it did not. Lengthened observation showed me, that many of these cases did badly; symptoms of grave disease occurring, and phthisis or other organic mischief showing itself at the close.

It naturally occurred to me, under these circumstances, to suspect that this azoturia was nothing more than a symptom, not of any special form of disease, nor of any diathesis, but of a condition common to many diseases. When emaciation occurs, then, from any cause whatever, we may expect to find this azoturia present. The advantage

of detecting it is great, if it be regarded in its proper bearings; but if it be looked upon as a disease *in itself*, the practitioner had better far be without the discriminating power on which he may pride himself, inasmuch as, content with his discovery, he may cease to inquire into the case as he would do were his attention less fixed on the urine.

It has several times happened, that I have seen patients who were described as suffering from azoturia. The urine has been observed carefully, the quantity passed during twenty-four hours, and the specific gravity, noted daily, and the cause of the disease considered to consist in the prevalence of a peculiar diathesis. The patients have presented all the peculiarities which systematic writers describe as indicative of this drain on the system. On inquiring into such cases, however, I have nearly always been able to discover some more or less localized disease to which all the symptoms might he traced—some disease attended with emaciation, and, therefore, as a consequence, productive of the highly-animalised urine. It is not very long ago that the symptom of azoturia so engrossed the attention of an examiner of the urine, and so entirely connected itself in his mind with a peculiar diathesis, that advanced and eventually fatal phthisis was entirely overlooked. This occurred in the case of a gentleman, pursuing professional avocations with great zeal, and who, observing his muscular power gradually on the decrease, became anxious as to his condition. The urine was examined, and declared to indicate azoturia; unfortunately, that discovery was considered, as it has been constantly considered, and is still considered, sufficient guide to treatment. In consequence of this, physical examination of the great cavities of the body had, I found, never been carefully made. Here, then, the indications of phthisis, so important to detect at an early period of the disease, altogether escaped notice. As consumption advanced, the azoturia became aggravated, and I was eventually called in merely to condemn the case as hopeless.

The emaciation sometimes occurring during chronic disease of the brain, is also attended with this discharge of an additional quantity of solid matter; and if the state of the urine distract attention from the true seat of disease, great mischief may be done, as the remedies in vogue for the relief of azoturia—viz., opiates and other narcotics, are such as often greatly aggravate the cerebral affection. In certain neuralgic cases also, this urine indicative of wasting is met with. Here, however, the error does not lead to much evil; the patient may be treated according to the rules prescribed for azoturia with advantage, and if the neuralgia (as is very likely) be relieved by opiates, the theory of diathesis, perhaps, may be considered supported by the results obtained, and the neuralgia thought to have depended on azoturia. I saw a case of this kind lately, which is now going on well enough, under the treatment which was adopted in order to remove the tendency to a large excretion of urea. The neuralgia and the azoturia will, I fear, however, in this case, eventually be shown to have

depended on some obscure internal disease, which physical examination is at present unable to detect.

When examining the specific gravity of urine, I would caution observers not to conclude that healthy urine is never passed much above the specific gravity of 1022, and that anything above 1026 or 7 must necessarily be regarded with suspicion. Nearly all healthy men pass, at some period of the day, an urine above the highest point just mentioned, and very often, *shortly after a full meal*, the specific gravity rises to 1030 and 32. This, too, will occur in persons of great mental and physical activity, and when in the enjoyment of the highest health.

I must not omit to direct attention to the cases which have been quoted at different times as illustrative of azoturia. They all, as far as I have been able to discover, contain a narration of symptoms favouring the position I have taken. They speak of pains of a severe character in various parts of the body, and these are in many instances accompanied by other indications highly suggestive of important latent disease.

When speaking on the subject of diathesis, I cannot refrain from introducing some remarks having reference to the subject so ably treated in the Gulstonian Lectures of this season. The old classification placing diabetes amongst urinary diseases has so completely held sway up to the present time, that the subject of the saccharine diathesis naturally suggests itself in this place. Those who have studied the works of Prout will be familiar with the idea which that chemist connected with the term "saccharine diathesis," and cannot fail to observe how completely all the opinions he advanced regarding it, appear subverted by the interesting discoveries of M. Bernard. From the moment those discoveries were published, our views, of necessity, underwent a change, and however far we may be even now from a full and correct interpretation of the phenomena of saccharine diabetes, we still feel perfect confidence that we have made a step in advance.

It is not my intention to enter upon the etiology of diabetes mellitus further than to remind you that the views of M. Bernard, ably enunciated by your Gulstonian lecturer, have shown that the liver, contributing as it does, to the formation of sugar in the normal state of the organism, may be regarded, under certain diseased conditions, as the producer of the diabetic state. That in point of fact, according to Bernard, we have not now to determine how a substance, foreign to the healthy constitution of the blood, becomes engendered in the system, but merely to inquire into the causes producing, on the one hand, an over-activity in the sugar-forming action of the liver, or, on the other, the diminution of the destructive power apparently possessed by the blood in health over that sugar when it has mingled with the circulating fluid.

Now, all this is clear enough, were the sugar secreted by the liver, and that produced by injuring the base of the fourth ventricle, identi-

cal with that existing in the urine of true diabetes. This, however, is not the case, and we are not, therefore, so nearly about to unravel the difficulty as we might at first be inclined to believe.

About two years ago I took the opportunity of obtaining blood from the hepatic veins of a dog, in order to determine the presence of sugar; for, like many others, I was at first a little incredulous. By the assistance of my friend, Mr. Hilton, this was effected without much difficulty.

On examining the blood obtained in this way, I found, it is true, that it yielded me sugar; but there was a peculiarity in the reaction of the tests, which led me to suspect I was not dealing with the same sugar as that contained in the urine of diabetes. It was quite impossible for me at the time to undertake a chemical investigation of the subject, and I was not sufficiently satisfied with my results to venture on publication. Some months ago I mentioned my suspicions to my friend, Dr. Pavy, who has thrown much light on this interesting subject, and he told me that the same doubt had occurred to him some time since, and he immediately showed me from his note-books that he had worked the question out very satisfactorily, though he had not published on the point. Having Dr. Pavy's permission to do so, I will now detail the results of his investigations. It appears that the principal point of difference between these sugars consists in the greater facility possessed by the hepatic sugar, and by the sugar of *artificivl* diabetes, of undergoing destruction by contact with animal tissue. This has been shown by an experiment made on the sugar of *artificial* diabetes, comparing the result with that obtained by similarly treating grape sugar and *true* diabetic sugar. The experiments were conducted as follows :—Three vessels were taken. In the first, a quantity of pounded liver, obtained from a healthy dog, was placed with a solution of the urine of artificial diabetes; the specific gravity of the solution was 1045. In the second vessel was placed pounded liver with a solution of common grape sugar, of specific gravity 1040. In the third was placed pounded liver with a solution of extract of true diabetic urine, of specific gravity 1040. The pounded liver was used (as any other animal matter might have been) merely to induce changes in the elements of these saccharine principles by its presence. The three mixtures were now set aside for nine days. At the end of that time, on submitting them to examination by Barreswill's solution, it was found that the artificial diabetic sugar had entirely disappeared, while the reactions were obtained in all their completeness from the two other solutions. Experiments made with the same solutions, substituting blood for pounded liver, led to the same results, showing a power of resisting decomposition on the part of grape sugar and *true* diabetic sugar, far exceeding that existing in sugar obtained by the production of diabetes artificially.

There seems little doubt that the sugar of diabetes is a higher quality of the principle, and that it can preserve its atomic arrange-

ment with far greater force than the hepatic variety. A power, however, seems to reside in the blood, which after *some length of time* eventually destroys, not only hepatic sugar and that of diabetes artificially produced but even that of true diabetes mellitus. Thus Dr. Pavy's experiments show that if the blood taken from a diabetic be allowed to coagulate, and the serum then be separated from the crassamentum, we can detect scarcely any evidence from the latter after a very long exposure. In the serum, however, it can be detected in quantity till decomposition is thoroughly set in. For some considerable time both crassamentum and serum give full evidence, however, which contrasts strongly with the reaction of blood taken fresh from the right ventricle in health, and which contains *hepatic* sugar, for here the sugar disappears almost immediately the separation into serum and clot is completed. It is almost certain that when we produce the artificial diabetic state by operation, we obtain in the urine the hepatic sugar of the liver. It is also proved that this sugar of *artificial* diabetes is not the same as the sugar of *true* diabetes.

Now, of course, were these sugars identical, we might consider true saccharine diabetes as a disease in which the sugar-forming property of the liver became abnormally active; or, on the other hand, a disease in which normal sugar was formed in the liver in usual quantity, but that the blood had lost the power of destroying it when so formed, and that it therefore appeared in the urine.

The results I have detailed place us, however, in a very different position. We know now that true diabetic sugar is destructible only with great difficulty, and that it is not the same as ordinary hepatic sugar. The question will then arise—Are we to regard the sugar of diabetic urine as a modification of that poured into the blood by the hepatic veins in health, or, on the other hand, as a product of disease bearing no relation whatever to the sugar of the liver?

To those who have studied the subject of sugar in its chemical relations, who are acquainted with its varieties and the facility with which these are convertible into each other by the most simple processes, there will be no difficulty in believing that the sugar of diabetes may be easily derived from that produced in the liver in health. Late experimenters on the sugar obtained from the vegetable kingdom have shown how easily transmutations are thus effected, and chemical properties developed or abstracted by simple contact with materials apparently possessing anything but chemical activity. No one can fail to be struck, for instance, with the curious fact, that the sugar contained in fruits possesses a certain action on light, influencing polarization, which action is precisely reversed in the sugar obtained by *crystallization* from the very same source. Thus, the gummy kind of sugar obtained from grapes possesses the property of *left-handed* circular polarization; but if we allow this sugar to lie exposed, a kind of imperfect crystallization occurs throughout the mass; and if we collect the granular crystals so formed, we find we have in these a sugar differing

materially from that originally extracted from the fruit. Its chemical constitution is not the same. Its constitution is $C_{12}\ H_{14}\ O_{14}$, instead of $C_{12}\ H_{12}\ O_{12}$; and when examined optically, it is found to possess the property of *right-handed* circular polarization. The change appears to be effected here by some constituent of the vegetable juice exercising its influence as crystallization goes on—probably the acids play an important part. Now, the liver, owing to some diseased action, may be supposed, in diabetes, to produce a sugar differing from that of health—a sugar which cannot be destroyed by the changes taking place naturally in the blood—changes rapidly affecting and destroying healthy hepatic sugar.

The phenomena of diabetes mellitus are, then, not quite so simple as the experiments and discoveries of Bernard would at a first view make them appear: and we have yet to determine the causes in action for the formation of this abnormal sugar. Does the presence of a different ferment interfere—even as we observe catalysis productive of varying results out of the body—may not an analogous action be going on in the liver? and, if so, what may be the nature of the ferment productive of disease, and whence is it derived? Are we to look to the portal blood for the ferment, or controlling influence which forms this less destructible sugar? And is it owing to this diseased state of blood that the liver, even though unaffected, is unable to cause the changes occurring in health?

But we need not have recourse to the theory of a ferment. The portal blood may present such principles to the liver as are only convertible into the *true diabetic sugar*. So far as we can yet determine, then, the whole phenomena of diabetic disease may eventually be traced to an abnormal state of the bile, gastric juice, and pancreatic secretion, any one or all of which may interfere with the formation of healthy products in the portal blood, and so overpower a healthy liver in the discharge of its office. Analogy would certainly, however, rather direct us to conclude that in diabetes the function of the liver becomes altered under the influence of some cause as yet unknown. Bernard has proved that the organ in health has a very strong transformative action on grape sugar; and so powerful is this, that we should almost be entitled to conclude, even in the event of the portal blood bringing diabetic sugar, ready prepared, into the hepatic circulation, that it would be metamorphosed by the liver into normal *hepatic* sugar before it could reach the cava through the hepatic veins.

These results, then, taken together, render it probable that we are to look for the cause of diabetes mellitus in a disturbed state of the hepatic function, not in an increase of *natural* action, but in an action varying in *kind*. We see that in health the liver would reduce proximate animal principles to a normal hepatic sugar, and in the perversion of force occuring in diabetes mellitus, we have a product given us approaching in character, it is true, to the normal sugar, but by no means identical with it. There is great facility for theorising with

respect to the agencies in operation in effecting this change of action. As vegetable juices contain principles which, by simple contact, can alter the chemical and optical qualities of the sugar first generated in the fruit, how easy to believe that the elaborate fluids contained in the several parts of the circulatory system of the liver may do the same. We know that acids are active in the vegetable kingdom—we know that the liver-substance is acid—may not an over acid state cause the production of this abnormal sugar? or may not even a too slow circulation through the organ (by allowing too long contact with acid matter) bring about disease? These are questions requiring much consideration.

In reflecting on the phenomena of this important disease, we are naturally led to consider the anatomical relations of the organs most obviously concerned in its causation; and the stomach and liver must more especially present themselves to our notice. The position of these organs—situate as they are in the immediate vicinity of the central masses of the sympathetic, the semilunar ganglia, and the splanchnic nerves, and supplied also with branches having immediate connexion with the cerebro-spinal system,—is in itself suggestive of the high importance of the offices discharged by them, of their sympathies and close relation. In this part, then, of the living and moving organism, a most intimate union is effected between the sympathetic and cerebro-spinal systems—systems presenting a curious and doubtless intentionally-different arrangement as regards their chemical relations, and one which has been, as far as I can ascertain, entirely overlooked by physiologists; an arrangement having most certainly a deep meaning, and one which I fully believe is to throw light on many obscure problems in medical science. I allude to the distribution of the ultimate fibrillæ of the sympathetic and cerebro-spinal systems. Thus the ultimate extremities of the sympathetic are almost entirely spread over parts possessing an alkaline reaction, while precisely the opposite is the case with the febrillæ of the cerebro-spinal system. The former lie in mucous and serous surfaces, and in the bloodvessels bathed with alkaline fluid; the latter lie in muscular fibre and in the cutis as cutaneous nerves, and in both cases are bathed in strongly acid secretion. Now there is no part of the organism to which we can point in which these chemical opposites are so freely interwoven as in the neighbourhood of the liver and stomach; and here again we are attracted by the peculiar nature of the secretions poured out by these organs. They seem to be exceptions to the general rule—to be the parts, as it were, acted upon by the electro-chemical arrangement, and parts to which it is subservient.

My object in taking this notice of the nervous relations of the stomach and liver is merely preliminary to making a suggestion to my fellow-labourers in this important field, to look carefully to the state of what I shall presume to call the great nervous centre of the sympathetic in diabetic cases, whenever opportunity may occur. In this

terrible malady, we may perhaps there find the origin of evil in some diseased condition giving rise, not to the increased activity of glycogenesis, but to a diseased state of the hepatic function, productive of the sugar we find in true diabetes,—a sugar difficultly destructible, and therefore not hepatic sugar, nor the sugar produced in the urine by puncture of the base of the fourth ventricle.—*Lancet, May* 30, 1857, *p.* 547.

40.—ON THE PHYSIOLOGY OF SACCHARINE URINE.

By Dr. George Harley, F.C.S., of University College, London.

[It has been shown, by Prof. Bernard, that the normal production of sugar by the liver is owing to a reflex nervous action, the stimulus being transmitted by the pneumogastric nerves to the brain, and reflected along the spinal cord and sympathetic nerves to the hepatic organ. Dr. Harley has shown, by experiment, that it is possible to produce artificial diabetes by means of stimulants introduced into the portal circulation.]

At present a great diversity of opinion seems to exist with regard to the cause of saccharine urine. Some authors speak of it as dependent upon a morbid condition of the liver, others as the result of disease in the nervous system, while a third class still adhere to the old opinion of its arising from disordered digestion. They appear altogether to ignore that one and the same symptom may spring from a multitude of causes, and that as saccharine urine is not of itself the disease, but only the most prominent symptom of a hidden complaint, it too may be the product of a variety of morbid actions quite distinct from each other, and consequently requiring diametrically opposite treatment. If, for example, the normal stimulus of the liver is exaggerated, an abnormal amount of sugar will be secreted; and if the quantity formed is greater than the amount requisite to supply the wants of the system, the excess which then acts towards the organism, as a foreign body, will be eliminated with the urine, and the disease, diabetes mellitus, established. If, on the other hand, the stimulus, instead of being exaggerated, is abnormally feeble, a less amount of sugar will be produced by the liver than the wants of the system demand, and a disease which as yet we possess no means of recognising, will be the result. The presence of sugar in the urine does not, however, necessarily prove that the glucogenic function of the hepatic organ has been exaggerated. For even in cases where only the normal amount of saccharine matter has been formed, the sugar in the blood may be present in excess, in consequence of some diseased state of the system preventing its assimilation. In such cases, the sugar will gradually accumulate in the blood, until at last the excess circulating in the body will act as a foreign material, and as such be eliminated by the urine.

Diabetes mellitus may further originate, either in such a change in the structure of the parts which secrete the saccharine matter as will admit of their performing more than the ordinary amount of labour, or in some organic change in the nerves which call the function into action, causing them to over-stimulate the sugar-forming apparatus. There are yet other two causes of diabetes sufficiently important to be here noticed. The first may originate in a foreign stimulus, in addition to the normal one, directly applied to the liver; the second, in such an artificial irritation of the nerves, as will excite them to communicate an excessive stimulus to that organ. A good example of the latter cause is to be found in the experiment performed by Reynoso, who discovered that by making an animal breathe irritating or stimulating vapours, the reflex nervous action might be increased to an extent sufficient to produce an exaggerated secretion of sugar, and to render the animal so operated upon for a time diabetic. This fact has been adduced by Bernard as a strong proof of the correctness of his view with regard to the origin of the normal reflex action. Without wishing to question the fact that irritation of the respiratory organs in animals produces a flow of saccharine urine, it may be remarked that, in making similar experiments, I have not found it so easy to arrive at the same satisfactory results which Bernard seems to have obtained. For example, I caused a robust rabbit to inhale sulphuric ether during seventeen minutes. In twenty minutes afterwards, and again in one hour and a half the urine was tested without the slightest trace of sugar being detected. To another adult healthy rabbit, in full digestion, I slowly administered chloroform until he became completely insensible,—indeed, much difficulty was experienced in restoring him. Two hours afterwards the urine was tested for sugar, with no better success than in the previous case. I compelled another rabbit to inspire ammoniacal vapours during five minutes, without being able to produce a flow of saccharine urine.

As the ill-success attending these experiments might arise from not giving a sufficiency of the respective stimulants, I administered to other rabbits a very much larger quantity; and in one case, the most satistory, I succeeded in detecting a small quantity of sugar in the urine. This result was not, however, attained until after I had rendered the animal five times completely insensible within twelve hours, by a mixture of chloroform and ether. This success, although it confirms the observation of Reynoso, that the secretion of sugar may be augmented by an irritation applied to the pulmonary branches of the pneumogastric, even taken in connexion with the result of section of the cervical pneumogastric, does not appear to me to justify the conclusion of Bernard—that in the normal state, respiration is the excitor of the glucogenic function of the liver.

I believe the results of experiments clearly indicate, that *if* the pneumogastric is the nerve which carries the stimulus to the brain, to be from thence transmitted by the spinal cord and splanchnic nerves

to the liver, the point of departure of the stimulus is most probably in the liver itself, and that the cause of the reflex action may originate in the stimulating effect of the portal blood upon the hepatic branches of the pneumogastric nerve. If, for example, the stimulating effect of the blood of the portal vein be imitated as much as possible by injecting into that vessel substances such as alcohol, ether, chloroform, methylated spirit, or ammonia, the liver is excited to secrete an excess of sugar, and the animal operated upon is for a time rendered diabetic. The following experiment illustrates this fact very clearly:

I injected ten cubic centimètres of sulphuric ether mixed with thirty cubic centimètres of water, into one of the branches of the portal vein of a full-grown Newfoundland dog, half-an-hour after he had been fed. When he rose up after the operation he appeared intoxicated, and staggered a little as he moved about. This effect, however, soon disappeared, and in a few hours the animal looked as if nothing had been done to him. In two hours after the injection was made I passed a catheter into his bladder, but did not obtain sufficient urine to enable me to satisfy myself whether it contained sugar. Some hours afterwards, when I had obtained enough urine, I found that it readily reduced the copper in Barreswil's liquid, thus indicating the presence of saccharine matter. To assure myself that this effect was not due to the presence of any other substance, I boiled the urine in order to coagulate the albumen, of which it contained a little, then evaporated it almost to dryness, dissolved the residue in boiling alcohol, and filtered. The filtered liquid was next evaporated to drive off the alcohol, and an aqueous solution made. On testing the latter for sugar with the sulphate of copper solution, its presence was clearly indicated. Although by this method the existence of saccharine matter was rendered almost undeniable, I still wished to convince myself of its presence by some other means. The urine which the dog passed the next day was therefore fermented, and carbonic acid gas and a trace of alcohol were obtained, thus placing beyond a doubt the existence of sugar in the urine. In consequence of the dog breaking his chain and escaping, I am unable to state how long he remained diabetic; but he was certainly in that condition forty-eight hours after the injection of the sulphuric ether.

The following case of which I shall speak very briefly, proves the presence of sugar in the urine until the third day after the operation: A very large dog (the largest I ever saw) was treated in the same way as the preceding one, but he appeared to suffer much more from the operation. His urine was so loaded with bile that I was forced to decolorize it before testing it for sugar with the tartrate of potash and copper, which however it readily reduced. I also fermented the urine, and was able to convince myself of the existence of saccharine matter in it until three days after the injection had been made.

In another case I injected nine cubic centimètres of ether, mixed with thirty cubic centimètres of water, into the portal vein of a small

dog. He became insensible, and continued so during a few minutes. Twenty-four hours afterwards he was killed by section of the medulla oblongata, and in his urine the presence of sugar was detected, both by the fermentation and by the copper test..

The following case shows how ammonia has the same power as ether in causing the liver to secrete an abnormal amount of saccharine matter:

Into the portal vein of a good-sized dog, in full digestion, I injected fifteen drops of liquor ammoniæ, diluted with forty cubic centimètres of water. In twenty hours afterwards, on the animal being killed, his bladder was found enormously distended with urine, which not only reduced the copper in the liquid of Barreswil, but fermented most rapidly.

I have on several occasions repeated the experiment with ammonia, and have not yet met with a single unsuccessful case. Attempts with chloroform, on the other hand, are not invariably successful, as they sometimes result in the death of the animal, especially if the dose be considerable, as the following example proves:

Into the portal vein of a large sheep-dog I injected a mixture of three grammes of chloroform, ten cubic centimètres of ether, and fourteen cubic centimètres of water. He died three hours after the operation. Notwithstanding this untoward circumstance, I found that the urine remaining in his bladder after death contained a certain amount of sugar. In operating with chloroform, it is best to use only a few drops, as then the animals seem to suffer but little inconvenience.

In another experiment I injected into the portal vein of a small dog ten cubic centimètres of a liquid composed of equal parts of alcohol and water. Two hours afterwards I examined the urine, and found that it contained sugar, but in small quantity. As I had great difficulty in obtaining the urine of this animal, I ceased making any further observations on him.

Into the portal vein of another dog, of the Skye-terrier breed, I injected ten cubic centimètres of the common methylated spirit, diluted with thirty cubic centimètres of water, six hours after he had eaten a full meal. For a few minutes after the operation he appeared to be intoxicated; but this effect soon disappeared, and on the following day he seemed perfectly well. When he was killed, his bladder was found distended with pale-coloured urine, which contained a considerable amount of sugar, as was seen by the quantity of copper it reduced, and the facility with which it fermented.

It may be here mentioned that all the dogs so treated vomited after the operation, from the irritation, no doubt, of the pneumogastric nerves.

These experiments are selected from a number of others, which it is quite unnecessary to cite, as the results obtained were identical. From the total of my experiments upon this point, I conclude—firstly, that a flow of saccharine urine can be induced by means of

stimulants introduced into the portal circulation, even in animals that have been fasting during twenty-four hours; and secondly, that the introduction of these stimulants sometimes produces albuminuria and an increased discharge of bile, as well as of saccharine urine.

The question now to be considered is, "In what manner do the stimulants act—is it directly, by exciting the tissue of the hepatic organ, or indirectly through the nervous system?"

The assertion, that an organ like the liver can be excited to perform its function without the intervention of the nervous system, may appear to some as unwarranted, Indeed, were it not that we already know muscles to possess a contractile power altogether independent of nervous influence, I should not have dared to hazard such an opinion. Bernard, however, has clearly demonstrated, on frogs poisoned with wourali, that although the influence of the nervous system can be totally destroyed (as is seen by the muscle not contracting when the nerves are galvanized,) galvanism, applied directly to the muscular fibre itself, excites immediate and violent contraction. I have frequently had occasion to repeat this experiment, and am well satisfied of the justness of Bernard's conclusions. In the case of the muscle we have, therefore, indubitable proof that the specific property does not exist in the nerves, but in the muscle itself. And I see no reason for doubting that the various internal organs of the animal body are constructed for the performance of a special and peculiar office, and possess within themselves their specific properties, altogether independently of nervous agency; and I am further of opinion, that when we shall be as able to separate the nerve agency from the internal organs, as we are to part it from the muscles, we shall be equally successful in calling their functions into action, by the direct application of electricity, or any other stimulus, to the tissue of the organs themselves. Professor Bernard seems to take a similar view of the subject, for, speaking of my experiments, he observes that the stimulants may have acted immediately on the tissue of the liver.

There is certainly another, and apparently a more simple, mode of explaining the influence of the stimulants injected into the portal circulation upon the glucogenic function of the liver, and one which will, moreover, be more readily acceded to, because it does not oppose any of our old views regarding the specific properties of organs or of nerves. The stimulants may act by exciting the hepatic branches of the pneumogastric nerve to transmit an impression to the nervous centre, to be from thence reflected to the liver through the splanchnic nerves, and cause an increased secretion of saccharine matter; and if this be the correct explanation of their mode of action, the normal secretion of sugar is very probably caused by the stimulating effect of the nutritive materials in the portal blood. In those cases where the vena portæ is either accidentally or intentionally obliterated, the nutritive materials absorbed by the mesenteric veins will take a circuitous course towards the liver, and in that case the blood of the hepatic

artery will excite the secretion of sugar. The following facts materially strengthen the view of the normal secretion of sugar being the result of a stimulus applied to the hepatic branches of the pneumogastric nerve.

During the time of digestion, the blood of the vena portæ must of necessity prove most stimulating, as it is then loaded with nutritive materials; and this happens to be exactly the period at which the greatest quantity of sugar is formed. On the other hand, the blood of the portal vein of a fasting animal contains very little nutritive material; it is, therefore, but feebly stimulant, and, consequently, during this period the secretion of sugar ought to be lessened. This, in fact, is exactly what occurs, for in a fasting animal the secretion of sugar has invariably been found to be at its minimum.

M. Bernard has pointed out that the liver of a dog nourished entirely on fat does not secrete more sugar than if the animal had received no food at all; and this is precisely what might be *à priori* expected if the above theory be correct. For in consequence of the fats, which are scarcely if at all stimulating, being absorbed by the lacteals, and entering the general circulation by the thoracic duct, without passing through the vena portæ and liver, the blood of the portal vein of a dog nourished exclusively on fat does not contain more nutritive material than that of a fasting one. It cannot, therefore, be more stimulating in the one case than in the other, and, consequently, the production of sugar ought in both cases to be at the minimum. This agrees perfectly with the facts already cited.

These data show that the foregoing hypothesis of the reflex action, which normally produces the secretion of sugar, is not based on illogical grounds. There exists, indeed, but one argument against the theory—namely, that while section of the pneumogastric nerves in the neck at once arrests the secretion of sugar, division of the same nerves below the point at which they send branches to the lungs is not followed by a similar result. This, too, is the very fact upon which Bernard founds his theory of the reflex action originating in the lungs. And upon a cursory view of the subject, it might be considered equally valid as an objection to the former, and as a commendation to the latter hypothesis. If we examine the point of argument, however, we shall find that the mere fact of the disappearance of sugar from the liver after section of the cervical, and not after division of the thoracic pneumogastrics, is in reality of little value, since it can be readily accounted for on other grounds. The liver ceases to secrete sugar in all cases where animals are subjected to severe operations, whether of the pneumogastric or of any other nerve. Indeed, whenever a febrile state of the system is set up, the glucogenic function of the liver becomes immediately disturbed; section of the cervical pneumogastrics is, moreover, one of the severest operations to which an animal can be subjected: it is not, therefore, in the least degree surprising, that the saccharine secretion should be arrested. The same thing occurs after

a variety of severe operations on different parts of the body, entirely unconnected with the nerves supplying the liver. Besides this, the slow asphyxia to which animals with divided cervical pneumogastrics are subjected, is sufficient of itself to account for the disappearance of sugar from the liver.

On the other hand, since division of the pneumogastric nerves below the lungs in general entails neither the death of the animal, nor gives rise to any symptoms of asphyxia, it is not in the least surprising that the glucogenic function of the liver should in that case suffer but a slight derangement. Another fact in favour of the statement, that the disappearance of sugar from the liver after section of the cervical pneumogastrics is simply dependent upon the severity of the operation, is to be found in the observation that an equal amount of injury done to the pneumogastric below the lungs is followed by a similar result. If, for example, the nerves are ligatured instead of divided, the animals frequently die, and in those cases no sugar is found in the liver. On examining the livers of two dogs, one of which died within sixteen, the other within twenty hours after ligature of the pneumogastrics at their entrance into the abdomen, I found that the saccharine secretion had been arrested, just as happens when the pneumogastrics are divided in the neck, and probably from an identical cause, the severity of the operation.

Thus it is seen that there really exists no valid objection to the idea of the glucogenic function of the liver being excited by means of a reflex action, originating in the hepatic organ. On the other hand, there is a very important objection to the view of its originating in the lungs. For, as has already been observed, the air entering the lungs must present the same amount of stimulating action throughout the whole day; and yet the result of that supposed action is found to vary at different times.

If, then, we are unprepared to relinquish entirely the idea of the intervention of nerve agency, and to suppose that the portal blood excites the secretion of sugar by a direct stimulating action upon the tissue of the liver, we must, in absence of a better explanation of the fact, adopt the opinion that the glucogenic function in a healthy animal, under ordinary circumstances, is called forth by the stimulating action of the portal blood upon the hepatic branches of the pneumogastic nerves.

Since we now know that stimulants introduced into the portal circulation excite a flow of saccharine urine, we can easily understand how the excessive use of alcoholic drink may produce diabetes mellitus in individuals predisposed to the disease. The same fact explains to us how a disordered digestion is not unfrequently followed by saccharine urine. I may here relate a curious fact in illustration of the truth of the latter remark. About five years ago, at a time when I was much occupied in studying the physiology of diabetes, I regularly tested my urine twice a day, and on one occasion I found it to contain a small

quantity of sugar. On the day in question I had partaken freely of asparagus salad; and thinking that this might perhaps be the cause of the presence of sugar, I determined to try the effects of a greater quantity. The following day, the sugar having entirely disappeared from the urine, I again partook of the same salad both in the morning and afternoon. In the evening, on testing the urine, I found very distinct indications of sugar. As the observation was to me one of great interest, I determined to make some further experiments on the subject, in order to discover how many hours this state of saccharine urine would continue. During two days I ate large quantities of the asparagus salad, taking care to have it made as stimulating as possible with vinegar and pepper. The result was far beyond my expectations; for instead of the sugar disappearing from the urine in a few hours after I had ceased partaking of the diet in question, it continued to be secreted during several days, until I at last became very much alarmed, lest the disease had been permanently induced. On the evening of the fourth day the sugar had almost entirely disappeared; but on the fifth it returned in increased quantity—so much so, that a drop of urine falling on the boot left a distinct white spot. I could not account for the recurrence of the disease, as I had been particularly careful in my diet during the two previous days.

I have mentioned this experiment, because it appears to me that if a flow of saccharine urine be induced in a healthy person, as I consider myself to be, by disordering the digestion and over-exciting the liver, it is very probable that a cause insignificant in itself, but operating upon a predisposed constitution, might tend to produce the disease. Sugar in the urine has been found after eating cheese and other indigestible substances. It is worthy of remark, that Dr. Jessen, of Dorpat, has rendered horses diabetic by feeding them with hay damaged by moisture. M. Leconte has also found sugar in the urine of dogs after he had administered to them the nitrate of uranium. Several other substances have the same effect, and I have no doubt, but that a great number more stimulants will be afterwards found to produce similar results. I cannot refrain from mentioning with what pleasure I perused a communication of M. Bernard's, entitled, On the Influence of Alcohol and Ether on the Secretions of the Digestive Canal, of the Pancreas, and of the Liver, read before the Société de Biologie. M. Bernard, instead of putting the alcohol and ether, as I had done, directly into the portal vein, introduced them, by means of a long œsophagus tube, into the duodenum of dogs, and allowed them to be absorbed through the walls of the intestine into the portal circulation. The result, as might *á priori* have been anticipated, was identical with what I had previously obtained. M. Bernard, in fact, found that six cubic centimètres of alcohol mixed with an equal amount of water was sufficient to excite the liver to secrete a large quantity of sugar, even while the animal was fasting. With ether employed in a similar manner, he obtained no less successful results. It would be

very interesting and important to ascertain if the simple introduction of alcohol into the stomach would produce the same effect. It is possible that in some cases it might fail to do so, on account of its being so acted upon by the gastric juice that it had lost its stimulating properties before it reached the portal circulation. The experiment is, however, one worth making, as in many works on diabetes, drunkards are said to be peculiarly liable to the disease.—*British and Foreign Med. Chir. Review, July*, 1857, *p.* 191.

41.—ON DIABETES AND SACCHARINE CONDITIONS OF THE URINE.

By Dr. Alfred B. Garrod, Physician to University College Hospital.

[In those cases of saccharine urine, unattended with marked diuresis, when of course one principal guide to the nature of the disease is absent, slight œdema of the legs—herpetic and prurigenous eruptions, boils, and low forms of inflammation form a group of symptoms, which may serve to guide our attention; so that the real nature of the affection may be ascertained by an examination of the urine.]

Saccharine urine is occasionally met with as a temporary occurrence in severe derangements of the digestive organs, and in chronic gout and rheumatism; and sometimes it is detected in severe and apparently functional disturbance of the nervous system.

Having passed in review the most important symptoms of this disease, I shall devote a few minutes to the consideration of the course it usually runs. I must beg of you, however, to bear in mind that my remarks at present will apply especially to the cases of confirmed melliturıa, and not to such forms of saccharine urine as appear to be temporary only in their nature, or to those where the diuresis is not well marked. I must also anticipate somewhat, by stating that, although these cases can be most materially benefited by treatment, yet few, if any, can be really absolutely cured. A diabetic patient, notwithstanding he may live for very many years, and arrive even at old age, is one whose life is at all times precarious, standing as it were on the brink of a precipice; and accidents, diseases, and shocks of various kinds, which to a healthy person would be of little moment, to him may be the cause of the greatest apprehension and danger. It is not in my power to give instances from my own practice of patients who have been diabetic for a *very* lengthened period; but I can point to cases of six, eight, and twelve years standing, the urine still remaining saccharine. These cases, I fear form the exception rather than the rule; and the lengthened course of the disease, when it occurs, is probably due to the great care exercised by the patients themselves, and is seldom found among the poorer classes, who are necessarily exposed to the vicissitudes of the weather, and at the same

time are seldom able to adopt such a plan of diet as is most conducive to their well-doing.

Among the secondary affections to which diabetics are liable, may be mentioned boils and carbuncles. Dr. Prout laid great stress on the connexion between a saccharine condition of the urine and the occurrence of these affections: in his article, he observes, "Diabetes very frequently (as far as my personal experience goes, *always*) *accompanies* carbuncles, and malignant boils or abscesses allied to carbuncles. This is a fact mentioned by several of the older writers, and is of great importance to surgeons, who usually have the management of these affections. Some years ago, an interesting case of this kind occurred to me. The patient was a middle-aged man, who told me, that for a long period, he had been subject, at intervals of a year or two, to boils, one of which, generally on the back or neck, assumed the form of carbuncle; and that, during such attacks, he always passed a large quantity of saccharine urine. When I saw him, he was recovering from one of these carbuncular suppurations; and the urine was copious and very saccharine. I lost sight of him afterwards, and am therefore unable to state whether the urine, in the interval of the attacks, recovered its healthy character. He repeatedly assured me, however, that its quantity, after a certain time, always became quite natural." I have given this quotation at length, as I consider the subject of great importance—at the same time, one upon which, as far as my experience goes, much error is entertained. That diabetic patients are liable to boils and carbuncles, I have little doubt. Some time since, a gentleman, a diabetic subject, who had previously consulted me, again called, after an interval of about two years. Almost the first question I asked was, "Have you managed to escape boils?" His astonishment was great, for he informed me that it was for this troublesome affection that he had come to town for advice. Such cases are by no means uncommon, and many instances will be found in the writings of Cheselden, the late Dr. Latham, and others. The point, however, to which I wish to direct attention is this, Are boils and carbuncles *necessarily* attended with a saccharine state of the urine? Dr. Prout was inclined to think they were; for he states that, as far as his personal experience went, diabetes always accompanies carbuncles and malignant boils, or abscesses allied to carbuncles. Within the last few years, I have made several observations to determine the correctness of this statement, and am quite convinced that it is erroneous. In one instance, a gentlemans, aged about 70, suffering from a large carbuncle between the shoulders, from which he subsequently died, I examined the urine very carefully when the disease was fully developed: no trace of sugar was discovered. In the second, a gentleman about 60 years old, the urine, at the time when a carbuncle existed on the back of the neck, exhibited no trace of sugar. I have also made several other examinations of the urine of patients suffering from boils and carbuncles, without being able to

find any saccharine impregnation. I think I am justified, therefore, in concluding that, *although boils and carbuncles are of very common occurrence in diabetic subjects, the presence of sugar in the urine of patients suffering from these affections is by no means constant, probably very rare; and that, when carbuncles and boils occur in patients not previously diabetic, sugar is very seldom found in their urine.* My colleague, Mr. Marshall, has, I believe, also examined this point in many hospital patients, and with the same result.

I have in some few instances seen *gangrene* in connexion with diabetes, and have no doubt that there is a close connexion between the two affections, in the relation of cause and effect. In one case, a female, aged 33, who appeared to have suffered from diabetes for some years, gangrene of one leg came on a few weeks before her death. This patient had also, during the last few days of her life, a purulent discharge from the right ear; and, on *post mortem* examination, a considerable quantity of pus was found upon the membranes of the brain. Another and more interesting instance occurred in a gentleman about 68 years old, who consulted me last year, and whom I found labouring under well marked diabetic symptoms, with strongly saccharine urine. I ascertained from him that the disease had certainly been present for many years; and that, about twenty months before I saw him, he had been laid up for several weeks with gangrene of the base of one toe; the cicatrix was still well marked. My patient was totally unable to account for the affection, for he had received no blow or injury upon the part. This connexion between gangrene and diabetes appears to have been noticed by a Frenchman, M. Marchal, who has recently read a paper on the subject before the Academy of Sciences. He relates a case of a man who, after having suffered from a succession of furuncles, exhibited gangrene of a toe, without obvious cause; and his urine was found to be strongly saccharine. The gangrened part came away; the wound cicatrised; and, by means of appropriate treatment, he much improved, and enjoyed pretty good health for about the space of two years. He then neglected himself, and his diabetic affection returned; the whole foot afterwards sphacelated, and the patient died. M. Marchal relates also a case, in the practice of M. Landouzy of Rheims, of sphacelus of the lower extremities occurring in a diabetic patient; and two other instances, under the care of M. Menestrel. One, a plethoric man, aged 60, had a patch of gangrene on the thigh and back, accompanied by much thirst and saccharine urine. The second patient had a large gangrenous patch on the back of the neck, also coincident with the presence of sugar in the renal secretion. M. Marchal considers that the presence of sugar in the blood induces an inflammatory condition of the lining membrane of the blood-vessels; and that this, in connexion with the low vitality which exists in such cases, induces the gangrenous tendency, which may lead either to furuncles or gangrene.

I could bring forward several other instances of gangrene occurring

in subjects who have suffered from a saccharine condition of their urine: for example, Dr. Durand Fardel states, in his work on the *Vichy Waters*, that, of two instances of diabetic patients who have died under his charge at that place, the immediate cause of death in one was gangrene of the leg; and my friend Dr. Halley also informs me that he has lost two diabetic patients from the same affection. I have taken this opportunity of dwelling a little upon the point; for though, I doubt not, the fact is familiar to many, still I think that, up to the present time, the frequent occurrence of this secondary affection has scarcely been noticed by authors, and gangrene has seldom been looked upon as one of the immediate causes of death in diabetes.

Diabetic patients, although apparently enjoying pretty good health, and feeling tolerably strong, are usually unable to bear any sudden shock to the system, such as would probably be but little felt by those in health. The late Dr. Prout informed me that, during the course of his practice, he had more than once been summoned to see diabetic patients who had travelled some long distance to consult him, and had found them either dead or dying—in his opinion, the result of over fatigue. Not long ago, a lady, a diabetic subject, whom I had seen professionally, suddenly died, apparently from over fatigue, produced by watching at the bedside of a relative. That such patients have but little power to resist the attacks of febrile or inflammatory diseases, I had a very striking proof a few years since. Two diabetic patients, a male and female, were in my hospital wards at the time when an epidemic of influenza was prevalent. The male patient, a man 38 years of age, had improved very much in health during his sojourn in the institution; had gained flesh, and lost most of the ordinary symptoms of the disease. His urine also had been reduced to about the average of 80 or 90 fluid ounces *per diem*, specific gravity 1031. One day he was seized with cold chills, slight sore throat, and redness of the tonsils and uvula. From this time he gradually became colder and colder, the respiration more and more difficult; and, in the course of a few days, he died, seemingly in the cold stage of a febrile attack, the system not possessing the power of reaction. At the *post mortem* examination nothing was discovered capable of explaining the cause of his sudden death; no other appearances, in fact, than those met with in other diabetics. A day or so after the seizure of the man, the female patient was attacked in a similar manner; the pulse became very rapid and almost imperceptible at the wrist; and it was only by the immediate administration of large amounts of ammonia, wine, and other stimulants, that life was preserved. Many of the other patients in the same wards suffered from influenza, but exhibited simply the ordinary symptoms of that disease.

It will generally be found that patients with saccharine urine are ill able to bear injuries or surgical operations. The following case well illustrates the fact:—A man, about 35 years of age, who had suffered

from diabetes for several years, but in whom the disease had been kept, to a considerable degree, in abeyance, injured one of his toes from a tight boot or some such slight cause. Ulceration ensued, and, after a time, opened one of the phalangeal articulations; the toe was amputated, but the stump refused to heal, and in about three weeks the patient died from the supervention of a gangrenous form of erysipelas. Most surgeons would hesitate to perform operations upon diabetic patients unless there is great urgency in the case. One of the most common terminations, however, of diabetes is by the occurrence of phthisis; and it is the prevalent opinion that this secondary affection constitutes the immediate cause of death in the majority of cases. I am, however, disposed to question the correctness of this opinion, although, at the same time, willing to allow that very many die from tubercular consumption. In most of the cases where I have had an opportunity of making a *post mortem* examination tubercle has been present in the lungs; in some in its advanced stages, in others but little developed; some lungs, on the other hand, have been completely free. Numerous other causes of death in diabetic subjects have been mentioned by authors; for example, Dr. Prout has noticed hepatic affection with jaundice, apoplexy, over distension of the stomach by food, excessive in quantity or improper in quality, &c.; sometimes the patient becomes comatose, the urine suppressed, and death ensues with all the symptoms of uræmic poisoning.

There is one point connected with the supervention of secondary diseases in diabetes to which I would wish particularly to draw attention, as it is apt, if passed over unnoticed, to be a fruitful source of error. I allude to the alteration which the urine often undergoes during these affections; it is not very uncommon to find a complete absence of sugar, a sign often regarded as favourable, generally, indeed, as a proof of the efficacy of some particular mode of treatment which a patient is pursuing at the time, but which is in fact too frequently a symptom of some secondary disease which may speedily terminate in death. I could quote many instances illustrative of this; one or two, perhaps, may not be without interest.

A gentleman, about five years since, consulted me, having all the characteristic symptoms of diabetes; urine strongly saccharine; specific gravity 1040. &c. After a few months every trace of sugar suddenly disappeared; but this apparently good sign was only induced by the rapid supervention of phthisis, of which he soon died. Within the last two months I had a patient in the hospital labouring under diabetes and phthisis in a somewhat advanced stage; and it was interesting to watch the increase and decrease of the diabetic symptoms (including the specific gravity of the urine,) alternating in an inverse ratio with those of the tubercular affection.

Lastly, I may mention the case of a lady who had suffered from diabetes for many months, but whose urine became perfectly free from sugar during, and for a short time after, a mild attack of scarla-

tina. The importance, then, of the knowledge of the disappearance of sugar under these circumstances cannot be too firmly insisted upon.

Occasionally diabetes assumes an intermittent or recurrent form; the patients, for a time, more or less lengthened losing all traces of sugar, and this principle again appearing in the urine. I have seen one or two cases of this form of disease; and Dr. Bence Jones has drawn particular attention to it. A very careful watching of such subjects would be exceedingly interesting, and might perhaps afford some clue to the nature of this disease, by the discovery of other phenomena which perhaps may arise at the time of the cessation of the saccharine matter from the urine. Patients who lose the sugar for a time from the occurrence of other detectable disease, cannot with propriety be considered as suffering from recurrent diabetes; the term should be confined to those cases in which it takes place without the presence of any such secondary affection. Now and then patients are found exhibiting sugar in their urine during full digestion, but not in the intervals; and these, if not absolutely diabetic, are yet probably on the brink of this affection, and liable to have it developed from slight exciting causes.

Lastly, diabetic patients *may* permanently recover. Several instances have been related; but those well authenticated are exceedingly few in number. I cannot say I have ever seen a diabetic patient, whom I have known to have been affected with the disease in a well-marked degree, suffering, for example, from the thirst, dryness of skin, and great diuresis, *permanently* lose all traces of sugar from the urine. I have, however, been assured by patients that they were formerly diabetic, and I have been unable, after repeated examinations, to find sugar in their urine. In many of the slighter cases, where the urine has been distinctly saccharine, and the patients have experienced symptoms, doubtless arising from the morbid state of the blood, as the herpetic eruption, &c., I have seen the renal secretion become perfectly normal, and remain so as long as I have been able to keep the patients under my observation.

From what we have now shown of the liability of diabetic patients to be affected by the occurrence of secondary affections, by shocks and injuries of various kinds, and from what we have stated as to the rarity of their ever completely getting rid of the disease, I fear we cannot fail to regard the prognosis as anything but favourable: but at the same time I am convinced that in many instances life can be greatly prolonged, so as to enable the patient to reach a moderate old age. To effect this, however, the strictest attention must be paid to diet and regimen, and the avoiding of great mental exertion and over fatigue of body.

Causes of Diabetes.—I am not aware that the cases which have fallen under my notice, in which I have been able to trace what appeared to have induced the affection, will throw any new light upon

the etiology of this disease; still it will be of some importance to dwell a little on this part of the subject, as, when discussing the pathology of saccharine urine, the recent physiological discoveries as to the nature of glycogenesis may, perhaps be in some degree, confirmed or refuted by such a study.

Dr. Prout believed that diabetes was much more frequently inherited than acquired; as far as my limited experience goes, I cannot acquiesce in this opinion. I have, indeed, known several instances in which more than one member of a family have suffered from the disease; but in by far the greater number of cases, I have seen no proof of any hereditary tendency: females appear to enjoy a greater exemption than males; but, as in gout, I should be disposed to consider this immunity due to the greater absence of powerful exciting causes: adults are, I believe, more subject to diabetes than children, although the latter are by no means exempt. With regard to temperament I can say little. As to other predisposing causes it seems to be a pretty well ascertained fact, that depressing agencies long continued, such as residence in cold, damp, and malarious districts, frequent excesses in alcoholic liquors, a poor and unwholesome diet, tend to induce the disease; but very commonly no such causes have been in operation, and the affection has come on suddenly in the midst of at least apparent good and robust health. The most commonly recognised *exciting* causes of diabetes may be divided into three classes:—

1st. Causes influencing particularly the skin.

2nd. Those affecting the nervous system.

3rd. Those influencing more particularly the mucous membrane of the alimentary canal, and the organs in connexion with this tube.

Among the first class may be mentioned, exposure to cold; drinking a large quantity of cold water when very warm: bathing when over-heated, and afterwards becoming chilled; attacks of rheumatism, and other febrile diseases, followed by exposure; the occurrence of boils, &c., but probably these last may be rather indications of already existing disease, than true causes of the affection. These form one class of exciting causes, and, perhaps, the most numerous: the majority of my hospital patients have assigned some one of these.

The second class of causes has, of late years, excited some interest, on account of recent physiological researches on the subject. Under this head are included cases in which injury to some portion of the nervous system has occurred, or where the patient has experienced some powerful mental shock, as sudden and intense grief, or extreme mental anxiety. A case has been related to me by a very intelligent person, in which saccharine diabetes was produced by prolonged anxiety and fear, arising from the following cause:—Two gentlemen fought a duel in Holland: after the first had fired he remained for some time in a state of suspense, from his adversary's pistol once or twice missing fire. He was uninjured, but, a day or so after, became diabetic. The narrator of this case was not a professional man, but

appeared to be fully conversant with the subject. That diabetes occasionally follows diseases and injuries of the nervous system, in the relation of effect and cause, seems pretty certain. Epileptics sometimes die with diabetes; I have known one instance. I have also seen examples of saccharine urine accompanying great, apparently functional, disturbance of the nervous system: and there are on record numerous instances of a diabetic state being induced by injuries to the back, concussions of the brain, and fracture of the skull. I examined and discovered sugar in the urine of a boy, a patient of my colleague, Mr. Marshall, who had a fracture of the temporal bone, produced by a blow on the mastoid process, and in whom, after death, pus was found in the cochlea and in the canal of the seventh nerve. One of my hospital patients, with confirmed diabetes, received a very severe blow on the head shortly before noticing the symptoms of his disease; and many examples of the influence of injuries to this part of the body, producing a saccharine state of the urine, have been brought before the profession by Dr. Goolden.

A third class of causes, of which, at present, little is known, consists in the introduction of irritating matters, as alcoholic fluids, indigestible food, &c., into the stomach. An excessive debauch has been followed by the disease; drinking large amounts of cider, or other diuretic fluids, have been stated to have produced the same result. A gentleman, well versed in such subjects, informs me, that he can produce, and ha more than once produced saccharine urine in his own person by eating very indigestible substances, and that such a state has lasted some days. An exclusively vegetable diet has been asserted to have caused diabetes; and the case is related of a priest, at a convent in the south of France, where the diet is of this character, having acquired the disease. A case is also related of nitre, taken in a very large dose in lieu of Epsom salts, causing great diuresis and mellituria, after the symptoms of irritant poisoning had passed off. In lower animals we shall also find that the introduction of alcoholic and other irritants into the duodenum, or portal vessels, is followed by a saccharine condition of the urine.

Lastly, it is affirmed, that the administration of certain remedies, as arsenic and quinine, produces, at times, a temtorary impregnation of the urine with saccharine matter. Although the causes included under the third head may occasionally operate in inducing the affection, yet they by no means necessarily cause it; otherwise we should find diabetes a much more frequent disease than it actually is. With regard to the whole subject of the etiology of diabetes, and of our knowledge of the causes which will temporarily produce a saccharine state of the urine, many and more accurately ascertained data are required than we at present possess.—*British Medical Journal, April 18, 1857, p.* 319.

42.—ON THE TREATMENT OF DIABETES BY RENNET.

By Dr. David Nelson, late Physician to the Queen's Hospital, and Professor of Clinical Medicine in Queen's College, Birmingham.

[The principle upon which this remedy is used suggests a far more extended application of it than merely as a sort of specific in diabetes, which it is not.]

The rennet or liquor pepticus is simply a substitute for what is wanting in the body, being analogous to, or identical with, the constituents of the frame itself, with which it takes up its position, and performs its functions just as aptly as if it had been secreted within such body, and so had formed a natural portion of its scheme-work of organization.

Now, the practical application of this great principle. as a matter of instinct, has been coeval with time itself, as evidenced in the use of animal flesh, the desire for water as a beverage, and the universal demand for salt, lime, sulphur, phosphorus, &c. &c., or their analogues, as represented in special kinds of food, such as garlic, onion, spices, fruits, and so on, each containing particular ingredients that are essential to the constitution of healthy blood, and of the other fluid and solid parts of the body. But the scientific recognition of the principle is of a date comparatively recent, and has only been the natural sequence of a more intimate knowledge of the elementary constituents of the living system, and of their relation to each other while within such system, as well as of the uses of the various complex fluids which are therein created. as it were, out of the primitive elements furnished originally from the soil or from the air. Thus, under such advanced knowledge in organic chemistry, has iron come to be *rationally* employed in cases of anæmia, gelatinoid phosphate of zinc in rickets, and various other diseases arising from mal-nutrition, cod-liver oil in deficiency of the fatty elements, ox-gall in torpidity of the liver, albumen in albuminuria, and even prepared blood itself in certain cases of defective assimilation, as affording to the stomach, like eggs and milk, all the various elements of nutrition nearly in the exact proportion in which they are wanted. We must recollect, however, that without a due supply of the healthy gastric juice, even such diets as those last mentioned could never be resolved into proper pabulum fit for the sustenance of the frame; and hence the obvious and direct utility of the rennet, or prepared liquor pepticus in all cases where the digestive power languishes, as furnishing to a body incapable of duly producing it, that which is prepared within another body in a healthy condition. It is true that we already possess various remedies that may excite the stomach, &c., to increased activity, and gentian, columba, biberine, and all the other stomachics or appetizers, may succeed in our hands under certain circumstances; but in others again they will not. They all act in an indirect manner as gastric tonics or stimulants, and their defects will much depend upon whether the dis-

order be merely functional or organic. In the former case they will be efficacious; but in the latter scarcely or not at all, and perhaps even injurious. Not so with this gastric liquor, for the utility of its employment is as clear and direct as that of water itself to the thirsty animal or dried-up plant; and though it has not hitherto been regularly used for its medicinal ends, such accident is only illustrative of the old familiar fact, that plenty of knowledge may exist without being practically applied; just as the world knew of the expansive powers of steam, and of the rapid transmission of the electric fluid before steam engines or electric telegraphs were devised. Empirically it certainly has been employed under the shape of whey-drinks, these having been considered remedial in cases of rickets, tabes, pulmonary consumption, and all the other varied forms of tuberculosis, or general granular degeneration. It has thus been exhibited just as burned sponge was wont to be used for glandular accumulations, without any just apprehension of the essence upon which its efficacy depended. And even though Reaumur and Spallanzani, as long as about eighty years ago, clearly did demonstrate to the satisfaction of themselves and others, that the gastric juice, after being extracted from the body, could dissolve meats even in glass vessels, provided they were kept at a blood heat, yet, being more devoted as physiologists than physicians, they did not advance to the next step of the philosophic ascent, by practically applying it to the art of healing, but simply noted it as a curious natural fact. In such application, however, it has, beyond all possibility of doubt, very great power, and exercises a most beneficial influence in every case of sluggish digestion, whether proceeding from the more ordinary derangements of the stomach, or from general tuberculosis, or scirrhus, or cancer. Of such cases, more or less serious in their nature, very many instances might be cited since the former paper was penned; but at present it is desirable to confine the attention to its decided efficacy in a disease usually so intractable and mortal as mellitus diabetes.

Being desirous, in these occasional papers, of pursuing this subject strictly as a physician, whose business it is to have in view ends of practical utility, the writer avoids all indulgence in mere hypotheses, or speculations as to remote causes, and confines himself to that alone which, to his mind, is clear and demonstrable. As observed in the clinical lecture already alluded to, there can be little doubt, as a matter of abstract doctrine, that the essence of genuine diabetes consists in some deep-seated and "secret derangement of the ganglionic innervation" of the stomach, &c.; but at the same time morbid anatomy does not, as yet, enable us to say what the nature of such derangement exactly is. Still, however, these derangements, as we know from innumerable other parallel cases, may be seated peripherally, as well as centrically, and, keeping this hard fact in mind, we are to guard ourselves against such fallacious modes of logic as might lead us into dangerous errors—errors which, though they be mere bubbles of amuse-

ment to the closet pathologist, become, in the hands of the practising physician, if adopted by him, weapons of life and death. Thus, even granting all the facts connected with those experiments first made in France, and consequently in this country, with a view to show that diabetes was due to some lesion in a certain part of the medulla oblongata, it no more follows, because diabetic symptoms may arise on puncture of a certain spot in the digestive or respiratory track, that such diabetic disease is invariably and undoubtedly due to disease in that quarter, than that blindness, deafness, paralysis, or apnœa are constantly to be traced to lesions of the particular central lobes from which the nerves involved in these affections take their rise. But, on the other hand, the following propositions are plain, and almost undeniable, namely,—

A. That all amylaceous or starchy matters within the living stomach are naturally changed, in the first instance, into sugar; which sugar is next, by a further process of digestion, converted into other complex forms fit for the nutrition of the body.

B. That, in the diabetic state, an arrest takes place at the saccharine stage of the process, apparently from a deficiency, or, what is virtually to the same purpose, a vitiation of the gastric digestive fluids, so that the sugar is absorbed as sugar, and as such expelled through the kidneys, without contributing to the nourishment of the system.

C. That languor, debility, and emaciation, &c. &c., necessarily accrue from such condition of the digestive organs, and ultimately must, and do, terminate in a mortal issue, unless means be devised to arrest or retard such downward progress.

D. That the gastric essence or essences of a healthy stomach, when well preserved from change, are capable of effecting an almost perfect digestion within the unhealthy living stomach; so that the processes are carried on to such a degree as even to insure the natural conversion of the saccharine elements into nutritive material, with a consequent increase in the bulk of the body, and a partial or total disappearance of sugar from the urine.—*Lancet, June* 6, 1857, *p.* 576.

43.—*On a Case of Diabetes, treated by the use of Rennet.* Dr. Iverson relates the case of a patient, in the lower class of life, who had well-marked diabetes, who was treated with rennet, and the details of whose case were carefully recorded day by day. As all the usual plans of treatment had been unsuccessful before the patient's admission into the hospital under Dr. Iverson's care, he made an experiment of the rennet treatment. In order to obtain as accurate a result as possible, it was determined, in the beginning of the treatment, not to alter the diet of the patient, except to recommend the greatest possible abstinence from drinking. By the table prepared by Dr. Iversou, the treatment seems to have been successful in diminishing the quantity of sugar in the urine; but from some circumstances

which are not explained, the patient was seized suddenly during the progress of the case with fainting, followed by spasms, ending in death. No post-mortem examination was permitted, and the case is therefore imperfect. Notwithstanding the unfortunate result, Dr. Iversen considers that the constant diminution of the urine, both in its actual quantity and in its saccharine ingredient, was very remarkable. He shows that in the first four days, during which the patient took no medicine, the average quantity of urine voided amounted to 10·108 cubic centimètres. In the following period of seven days, during which she took the rennet, the quantity of urine reached only 7·927 cubic centimètres, with a quantity of sugar amounting to 324 grammes In the next five days, during which she took the rennet in combination with phosphate of soda, the average daily quantity of urine sank to 6·988 centimètres, with 250·317 grammes of sugar. The patient herself attributed to the rennet the power of allaying in some measure the burning thirst which she experienced.—*Brit. and For. Med. Chir. Review, July*, 1857, *p.* 235.

44.—SUMMARY OF SEVENTY-FIVE CASES OF ALBUMINOUS URINE.

By Dr. Thos. R. Heywood Thomson, Liverpool.

Since the pathology of the urine has of late years been more generally taken into account in the investigation of disease, and the examination of it conducted with greater care, the more frequent discovery of the albuminous condition in cases not essentially nephritic has demonstrated that this ominous feature results not so often from change of structure in the kidney—Bright's disease and its modifications—as from mere functional derangement, brought on by overwork in eliminating certain morbid products from the blood in some diseases, or while operating compensatively (so to speak) in others. In proportion, too, as the urine has been submitted to the test of the microscope, as well as the ordinary tests, have we been enabled to estimate more surely the import of those cases in which albuminuria has obtained. The mere detection of less or more flocculence on heat and nitric acid, however portentous, is comparatively valueless without the aid of histology. The former merely indicates a condition, striking the alarm-note, as it were, but the latter brings under review the products of the change, and very often shows the exact stage reached in the complication. What the crucible is to the toxicologist, we may hope the microscope will become to the investigator of this pathological state—affording conclusive evidence. To use the words of Dr. George Johnson, "a microscopic examination of the urine is essential for the formation of a correct diagnosis;" "a microscopic examination of the urine is the best and only means of ascertaining the epithelial deposit;" "for the accurate discrimination of all forms of renal disease, the microscope will be found an invaluable aid;"—or of Mr. Simon, who

states, in his admirable paper on the Kidney, published in the 30th vol. of the "Transactions" of the Medical and Chirurgical Society of London, "so much more delicate is the microscopical than the chemical test, that it has twice happened to me lately, in cases of scarlatina, to find groups of blood corpuscles in the urine, when nitric acid had given no precipitate visible to the naked eye."

I have therefore thrown into a tabular form the most prominent histological features of seventy-five cases, in which the urine was found to be more or less charged with albumen,—accompanied with such few notes as were considered worthy of being jotted down at the time. The figures specifying the numbers in each section, "granular," "oily," "waxy," &c., do not always coincide with the total of each disease, as it not unfrequently happened that two or more abnormal characters

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	Total.	Granular Casts.	Oily Casts.	Waxy Casts.	Epithelial Casts.	Blood, free or aggregated.	Fatal.
Bright's disease	10	8	2	4	...	...	7
Scarlet fever (malignant). Eruption not well developed	2	...	...	...	...	2	1
Scarlet fever (anginosa). Eruption well developed	17	...	...	1	6	17	..
Scarlet fever. Eruption irregular; only out a day or two	4	...	...	...	2	4	...
Scarlatinal throat, without eruption	2	...	...	...	1	2	...
Rheumatism	2	...	...	...	2	2	...
Gout (obscure)	1	1	...	...	...	1	...
Typhus fever (second week)	1	...	...	1	...	1	...
Kidney, inflammation from calculus?	1	...	...	...	1	1	...
Catarrh	3	...	...	1	1	2	...
Pneumonia	2	...	...	...	...	2	..
Erysipelas	1	...	...	...	1	1	...
Liver, torpor and derangement of...	3	...	...	1	1	3	...
Peritonitis	1	...	...	1	...	1	...
Phthisis, in latter stages	4	...	2	1	...	...	4
Chlorosis	4	...	...	1	...	2	...
Oxaluria (strongly marked)	4	...	...	...	1	3	..
Phosphatic diathesis (strongly marked)	3	...	...	...	...	3	...
Pregnancy, latter months	2	...	...	1	...	2	..
Uterine diseases	5	...	...	...	..	5	...
Malignant disease of the bladder	1	...	...	...	...	1	1
Free use of turpentine, internally...	2	...	...	...	...	2	..
	75	9	4	12	16	57	13

were noted. So, too, the absence of heart-disease from so long a list may surprise those who know how often the two states are associated; but as in all the cases coming under my notice in which they co-existed, the kidney affection, as far as could be traced, seemed to have taken the precedence, or at least had become the most prominent, they were so noted. Even two cases of asthma, of long standing, in which valvular disease existed, together with Bright's disease, are classed in the latter, although it is possible that, could the cases have been traced *ab initio*, the asthma and valvular disease might have been proved to have led to the kidney complication.

Of ten cases of morbus Brightii, seven ran the variable, but downward course of that disease when confirmed, and terminated fatally. Three were apparently kept in check by appropriate treatment, but are still delicate. Manifest hypertrophy of the heart existed in three cases; valvular disease, with hypertrophy, in four; while three had no appreciable derangement of that organ. The waxy form of cast did not present so frequently, as we were led to expect from the experience of others. In one case, the details of which were submitted to Dr. Bence Jones, the quantity of urine passed daily during the last fortnight of life, only averaged nine ounces, and was several times as low as seven, the specific gravity continuing high, never less than 1032, and one day as high as 1045. Under the head of scarlatina I have twenty-five cases, in which there was some amount of flocculum on heat and acid, and after the examination of a considerable number of such, I can confirm the statement of Dr. Begbie, that in almost every case of scarlatina, the urine will be found to have *traces* of albumen, but in the majority it is only to be detected by the microscope, in the shape of free or aggregated blood corpuscles. In several of the cases, the eruption was so irregular and evanescent, that but for the sore-throat, spreading, amongst others, eruptively, and the albuminous condition of the urine afterwards, they would have been difficult to diagnose; while in two cases of scarlatinal throat, *without eruption*, it extended to others in the eruptive form; in both cases there was albuminuria. Two cases in which there was scarcely any eruption, or more properly speaking, suppressed, were followed by general dropsy.

Illustrative of the irregular manner in which this disease sometimes runs through a family, the subjoined may not be out of place:—The eldest son, aged sixteen, was the first attacked, and had simply scarlatinal throat and strawberry tongue, followed by albuminous urine, and excessive debility. An elder sister, aged nineteen, had the eruption strongly marked, running the usual course. A younger sister, eight years old, had the eruption only irregularly for a day and a half, with intense sore-throat. A still younger had the eruption running the usual course. Another, yet younger, had a few livid blotches, with great fever, and had sore-throat, followed by albuminuria. The youngest, a baby, had the eruption out vividly, without throat affec-

tion. Within the last month I have had two cases of checked (irregular) scarlatina, in which intense albuminuria, with blood and *casts*, succeeded within four days, and this notwithstanding here (as in every case where scarlet fever is suspected) warm, or vapour baths, to encourage the eruption, were at once ordered.

Of the cases of rheumatism, one was complicated with urgent pericarditis, and the urine continued throughout the attack, and for nearly three months afterwards, very albuminous, with abundance of epithelial casts and some blood, but gradually subsided under the continuous use of aperients and diaphoretics. In a case of obscure gout, still under observation, the albuminous condition recurs with every threatening, and only disappears on the decline of the arthritic symptoms, eliminating great quantities of lithates, and granular casts—a very undesirable symptom. Three cases are noted, in which the symptoms were those of well-marked catarrh, followed by dropsy, the urine being very albuminous, but soon losing this ominous character by restoring the free action of skin and bowels. Three cases of very decided albuminuria had no other appreciable origin than torpor and derangement of the liver; in one case the epithelial casts were freely thrown off for many days. In two persons suffering from intense pneumonia (in one, both lungs), the albuminous condition, from free and aggregative blood corpuscles, was very strongly marked for about a week. So, too, in a case of severe general peritonitis, probably extending to the serous covering of the kidneys, the urine was charged with waxy casts and free blood discs for ten days. The not uncommon condition of albuminuria in the latter stages of phthisis was noticed in four cases: in one, where the urine was carefully examined many times, the albumen present was so considerable as to cause a jelly-like consistence on heat and acid, and yet there was no trace of tubular casts or blood, nothing but immense numbers of spermatozoa. In this case some of the fibrinous part of the blood must have drained off by the kidney. In four well-marked cases of chlorosis, accompanied in three with anæmic bruits, the urine was albuminous for a considerable time; in one, continuing three months, with waxy casts; in another, the anomalous condition just described—*i. e.*, highly albuminous urine without a trace of tubular cast or blood—existed. Iron had the usual beneficial effects with all of them. Of seven cases, where either oxaluria or a strongly-marked phosphatic diathesis was present, with albuminous urine, the blood globules were mixed with a considerable amount of vesical epithelium, as well as the characteristic crystals, leading to the inference that mechanical irritation of the surface of the bladder had been the chief cause. In two cases, where the urine was albuminous in pregnant women, there was an interesting contrast; this condition came on in one of them probably only a few days prior to her confinement, and was not strongly marked, yet she had slight convulsions; in the other, aged thirty-eight, a primipara, who had for years been suffering from a sacculated condition of the œsophagus and almost

total obstruction to swallowing anything solid,—the urine was loaded with free blood corpuscles and waxy casts for upwards of two months before her confinement, and, notwithstanding a very long and severe labour, there was never once a threatening of convulsion; it is true, however, that as soon as the local hyperæmia was discovered a few leeches were applied over the region of the kidneys, and other means used to avert the contingency. In the cases of uterine disease, extensive ulceration of the os, the albuminous flocculence was traced to the presence of free blood discs, much vaginal and uterine epithelium, the result of the accompanying discharges. Two persons who had used turpentine improperly for several days (one for gravel, the other for tapeworm) were affected for upwards of a fortnight with albuminaria, blood having been freely passed and some fibrinous blood casts; and the irritation of the kidney was intense.

A few short cases still further illustrative of the importance of a microscopical examination of the urine, *whenever there is the slightest trace of albumen present or suspected*, may not be an unfitting termination to this paper. One case of malignant disease of the bladder is tabulated. This patient, who had passed considerable quantities of blood from the bladder for several years, had consulted the most distinguished surgeons of London and Dublin—was sounded by two of the most eminent practitioners in the former place, and although no stone could be detected, so strong were the evidences of that malady that the sufferings were declared to arise from calculus; others believed it to be the irritation of gout; the kidney, too, was suspected, as the urine was always albuminous: yet no one thought of applying the microscope. Soon after being consulted by this patient at the recommendation of his medical attendant, it occurred to me, on seeing the nasty strawberry-and-cream-looking, slimy deposit, after the urine had stood for a short time, to subject this to the microscopic examination; on which—strengthened by several successive results, there being no trace of kidney tubular casts, but abundance of free blood corpuscles, numerous caudate and filamentous multi-nucleated cells characteristic of encephaloid cancer—the case was pronounced to be one of malignant disease of the bladder, an opinion fully confirmed on the death of the sufferer eighteen months afterwards, when both bladder and kidneys ware found to be affected with encephaloid disease. Mr. Coulson, in his compendious work on the Bladder, says of such cases: "In general we are never certain of the nature of the disease until the parts are examined after death." After such a case, we may hope the microscope will enable the diagnosis to be more certain.

In another case, where the patient, upwards of sixty, was attacked with frequent severe hæmaturia, attended with much irritation of the bladder, and became despondent, being under the impression that as his father and two brothers had died of the same symptoms, with presumed malignant disease, at about the same time of life, his was likewise to terminate in the same way, several of the symptoms led to that

conclusion, until, on carefully examining the character of the urine under the microscope, no trace of diseased structure was discovered; only abundance of free blood, vesical epithelial scales, and numerous large crystals of triple phosphate. The case was declared to be one, probably, of simple irritation; treated with acid tonics, gallic acid, and buku; and gradually recovered.

It is to be feared in too many cases that, the symptoms pointing almost conclusively to a particular disease, as long as they do not indicate kidney affection, every secretion except the urine is noted. How common it is in fevers, exanthems, and inflammatory diseases, to administer diuretics, without a thought as to the condition of the kidneys; nay, the very fact of the urine being scanty, which should put us on our guard, is made the pretext for acting upon organs already perhaps overtaxed and unfit for work. It is not unreasonable to suppose that many a case of Bright's disease, or other chronic form of nephritis, has had its origin in the mistaken attempt to relieve the system by diuretics, when the kidneys were previously overwrought in eliminating from the blood what the lungs or the skin were incapable of effecting. The microscope and test-tube will, if properly applied, often save from such errors; and not only so, but will direct us to the right use of those means by which the kidneys can be brought safely to play their part in restoring the lost balance of health.—*Lancet, July* 4, 1857, *p.* 7.

45.—*Belladonna in Incontinence of Urine.* By G. B. Masfen, Esq.—[The patient had, at various times, been under treatment for this disease, with little or no benefit, except from such preventive measures as abstinence from drink in the after part of the day.]

I prescribed an anodyne alkaline mixture, with an occasional drastic aperient, till having seen Mr. Brooke's case in the 'British Medical Journal' of Feb. 21st, I ordered, on Feb. 28th, one-twelfth of a grain of extract of belladonna to be taken three times a day, when a marked improvement immediately commenced, which continued till after having the medicine for twelve days there was no more appearance of the symptoms. He continued under the same treatment till March 21st, when I discharged him apparently cured. I shall keep this case under notice, and, should any relapse occur, shall not fail to place it on record.

While on this subject, I may mention that I wrote to a some-time patient of mine, who had consulted several eminent practitioners in various parts of the kingdom, and who seldom passed a night without wetting his bed, from birth to the age of sixteen, to suggest this remedy to him. He replied as follows:—"The weakness with which I was afflicted so long has at last left me entirely . . . . Very likely the sea bathing at Boulonge did a great deal towards a cure, as I was not subject to it after I took a bath three times a week at six in the morning."—*British Medical Journal, April* 18, 1857, *p.* 315.

SURGERY.

AFFECTIONS OF THE BONES AND JOINTS, &c.

46.—ON AMPUTATIONS.

By Dr. John Sloane, House Surgeon to the Leicester Infirmary.

[The common methods of operating in many amputations are faulty. Probably many of them have come into general use recommended only by the charm of novelty, and become fashionable on no other foundation than the recommendation of some distinguished professional brother, who, with his mind perhaps imbued with some preconceived notion, may not have rightly interpreted the phenomena he observed.]

What are the comparative merits of the circular and flap methods of amputating? I shall allow Mr. Erichsen (whose work on 'Surgery' is the most recent) to answer. He says: "Educated in the doctrines of Mr. Liston, who invariably amputated by the flap method, and who certainly did this with wonderful precision and rapidity, I have been in the habit of performing this operation in preference to the circular, over which it certainly possesses the special advantages of greater celerity in performance, more perfect coaptation and smoothness of the opposite sides of the wound, and greater tendency to union by the first intention." That an amputation by flaps may be more quickly performed than by the circular plan, is true; and this was a great recommendation in its favour before the introduction of anæsthetics, but it now has lost its force, as two or three minutes more or less under the influence of chloroform matter little.

Picture in your imaginations a healthy patient whose thigh is being amputated by flaps, for an accident sustained a few hours previously. The following is the course usually adopted. The surgeon, with a laudable anxiety to have the end of the bone well covered, makes the flaps of a good size: he finds that the skin and subcutaneous areolar tissue retract much more than the muscles; but, by exercising a little force, he succeeds in bringing the edges together with several points of interrupted suture. As masses of muscle are bulging through the intervening spaces, long strips of adhesive plaster are applied, to complete the closure of the wound; and round the ends of these are applied two or three additional strips, to prevent them from slipping. There is now considerable tension in the stump; but, in a day or two

the swelling consequent on such an extensive wound has caused the tension to increase to an injurious degree, and the very results which we should expect usually occur. Inflammatory action runs high, causing much pain, and requiring the exhibition of opiates. Union by the first intention rarely occurs. Frequently, about the third day, the surgeon perceives a roseate blush in the lower part of the stump; poultices or hot fomentations are applied; the plasters and sutures are removed. Probably, in a few days more, pus has formed at various points in the limb, to which exit is given by incisions; and more or less sloughing of the edges of the wound has occurred. When the inflammation has been subdued, the flaps are again drawn together by plaster, and they unite by granulation. A large proportion of patients, however, do not successfully pass through this ordeal. Do not misunderstand me. I do not say that all these mishaps occur in every case of flap amputation, but in most we have one or more of them.

"Relieve tension," is a good surgical rule, which we act upon with beneficial results; as, for example, in diffuse areolar inflammation of the hand, where we prevent much mischief by early and free incisions; and, in the treatment of stumps, which I have described, effectual measures are taken to relieve the tension, which, it is my firm conviction, would never have existed had a more scientific method of operating, and a more rational mode of dressing the wound afterwards, been adopted.

The plans of amputation which appear to me to be most rational are the circular, or a modification of the flap. In the circular, the skin and subcutaneous tissues, being divided by one sweep of the knife, should be separated from the fascia to the extent of an inch or an inch and a half, according to the thickness of muscle. Then the muscles should be cut in an oblique direction upwards, so as to leave a sufficient covering for the end of the bone. The edges of the wound should be drawn together by interrupted sutures, and, in the intervals, short strips of adhesive plaster, allowing abundant space for serous or other discharges to escape. The advantages of this method of operating are, that allowance is made for the greater retraction of the cutaneous than of the muscular tissues. There is not a mass of muscle which is useless, as it is afterwards almost completely absorbed, and injurious, as it causes tension; and, to use the language wrongly applied, in my humble opinion, by Mr. Erichsen to the flap amputation, the circular plan possesses the comparative advantages of more perfect coaptation and smoothness of the opposite sides of the wound, and of greater tendency to union by the first intention.

If there be no great tendency to separation of the edges of the wound (and there never should be, if the operation were rightly performed), I cannot see the necessity of long strips of plaster, which cause tension; surely short strips will suffice to keep the edges together. It is important to leave spaces between the plasters for the exit of any discharge. In a hospital to which I was once attached, one of

the surgeons (a highly educated and estimable gentleman), anxious to procure union by the first intention, was in the habit of completely covering the end of the bone with strips of isinglass plaster; and, in his cases, sloughing and other untoward results were decidedly more frequent than in those of his colleagues who left some uncovered spaces.

The sutures should be removed on the third day, at the latest. In a patient from whose jaw Mr. Benfield lately removed an epulis, he extracted the pins from the twisted sutures in the wound in the cheek, at the end of forty-eight hours; and, when one was extracted, a little pus followed. There was union by the first intention in every part of the wound. Had this pin, which did not appear to be exciting mischief, been allowed to remain, what would have been the result? That the inflammation which was present, as shown by the formation of pus, would, in all probability, have caused the edges of the wound at that point to have separated. This case shows how soon sutures may begin to act as foreign bodies to excite inflammation, "with which union by the first intention is incompatible;" and union having already taken place, if inflammation did occur, the new structure would, as you know, readily break down. I have had opportunities of comparing the practice of two surgeons attached to the same hospital on this point. One almost always extracted the suture-pins on the third day; and, in his cases, there was almost invariable union by adhesion, the exceptions generally being where there was some delay, and the pins were allowed to remain a day or two longer; but, in one or two of these cases, union was perfect, notwithstanding the delay. The other allowed the sutures to remain undisturbed for five or six days, unless some redness or other sign of inflammation supervened; and union by the first intention was the exception in his patients.

The modification of the flap operation which I should recommend is the following. By cutting from without inwards, make the semicircular incisions of the usual shape through the integuments down to the fascia: these superficial flaps should be separated from the subjacent muscles to a sufficient extent; and then the muscles may be divided by two incisions, so as to form flaps. The methods of operating which I have proposed would be more painful and more tedious than the ordinary plan; and these would have been great objections before the introduction of anæsthetics, when it was considered very important that a surgeon should be a quick operator.

There is another point in the treatment of stumps, after amputation in the thigh especially, which does not always receive the attention it deserves, and the importance of which was first impressed upon my mind by Mr. Paget. This is the advisability of carefully bandaging the stump from above downwards, the soft texture being at the same time drawn by an assistant over the end of the bone. This practice tends much to prevent protrusion of the bone by curbing undue retraction of the soft parts.—*British Medical Journal, May 2, 1857, p. 363.*

47.—ON SOME DISEASES OF BONE.

By Dr. Samuel Wilks, Assistant Physician to Guy's Hospital.

[The question as to the malignancy of a new growth is the most important which can be asked concerning it. Though much disappointment has resulted from the failure of the long-cherished hope that the use of the microscope was an infallible guide as to the malignancy or not of a growth; yet this failure, so far from casting discredit on the use of the instrument, is really a bright feature in favour of its utility and importance.]

The microscope has proved that cancer and malignant disease are not universally interchangeable terms, and all praise rather than all blame is due to the instrument for the discovery; and this is the right lesson to learn from the fact; not that the instrument in failing to prove the connection is a sign of its imperfection, but that the use of the terms cancer and malignant disease as identical was a pure assumption on our part. Without considering the question whether the elements of cancer are peculiar or characteristic, it may be stated with some degree of confidence that the microscope is able to recognise its presence in an equal number of cases as can the naked eye, and probably oftener; but at the same time it is able to show that various growths which exhibit the utmost degree of malignancy are not cancerous, consisting, however, like the cell of the cancer, of the simplest structures, as fibre, bone, or cartilage. The microscope, too, on the other hand, may sometimes discover in a local growth the elements which exactly correspond to cancer, and are undoubtedly such, but, at the same time, little credit is placed on the decision, should the disease remain for years, and show no great evidence of malignancy. The fact, then, is clear, that the whole question has hitherto been based on imperfect knowledge and numerous theoretical assumptions; and we cannot but think that the microscope has done immensely in improving the one and overthrowing the other, and consequently deserves much credit for the result, though of course to those who believed they held the whole truth of the matter the instrument has proved a failure, since it has failed to confirm their chronic convictions. The microscope has, we believe, ever since its general employment, tended to show that there is no more distinct line to be drawn between cancerous and non-cancerous growths than between malignant and non-malignant disease, and that there are links between the most extreme kinds of innocent and destructive growths, as between all other objects in created nature. Ordinary experience is now confirming this statement, and asking why a surgeon should call a cancerous tumour of the breast malignant, when the subject of it is in good health, and has possessed it, perhaps, for a score of years; or why tumours composed of simple fibre, cartilage, or bone, should be called otherwise than malignant when they rapidly propagate themselves through the body and destroy the life of the patient. If malignant disease be that which kills its victim by the mul-

tiplication of abnormal growths in various parts of the body, then are such as are just mentioned malignant; or if a cancerous tumour be one which ought to follow the same course, but remains stationary and local for years without detriment to the patient, then of necessity very many tumours which to the naked eye or to the microscope are undoubtedly cancerous, are not malignant.

The subject of cancer and malignant disease is so important, that our ignorance of it is the cause of an immensity of error in our present pathology, but as facts grow we trust some master hand may grapple with the whole, and reduce them to some intelligible form. At present we believe we want more facts than theories—that is, complete facts. Hitherto we have been content with partial ones, and those who know our London Museums best are aware that, until late years, they have been little better than show-rooms, there being no history to explain the meaning of the bare fact in the bottle before us, and that a small number of specimens, could they but tell their tale, would throw a flood of light upon pathology. A perfect case, indeed, is of more value than a hundred imperfect ones.

Without prejudging the powers of the microscope, and denying that there is anything characteristic in the cell constituting cancer, the scale of epithelioma, the fibre of recurrent or multiple fibroid tumour, the bone of malignant osseous tumour, or the cartilage which sometimes pervades the organs to their destruction, we believe at present that the microscope has failed in determining any characteristic elements in these various growths. It may be true that under the particular circumstances respecting a growth in a part, with a good experience of the probabilities of only certain morbid structures invading it, a very perfect conclusion may be arrived at, or a very positive denial given to the apparent cancerous nature of a tumour when no foreign elements are found in it, but at the same time, we believe that all observations are tending to show that a cancer-cell in itself presents nothing remarkable, and that fast-growing cells, such as are seen in the gelatinous lymph about diseased joints, are not to be distinguished from it. Still, should there be any peculiarity, it is probably in reference to degree of size, as the large nucleus, rather than to any difference in kind, and the same may be said of epithelial cancer, that it owes its malignancy to the morbid excess in the evolution of scales from the surface, and that the microscope discovers no particular cell or scale which is characteristic; and this we think is borne out by experience in practice, that a simple warty tumour may become malignant, or that a papilloma and an epithelioma are not absolutely distinct. The recurrent or malignant fibroid is said to be distinguishable by some microscopists, and no doubt the fact of the abundant cell-growth and its general cancerous appearance to the naked eye, render it peculiar and different from a simple fibrous tumour; but, at the same time, we are not aware that any individual nucleated fibre composing it possesses a characteristic size or shape. Should, however, the microscope at some

future time detect a marked difference in a cell, a scale, or a fibre, which should denote its malignant character, we doubt if such will be done in the malignant cartilage or bone; for in all probability these substances are the result of a subsequent formation in a tumour which would have been fibrous, but from the mere accident of the growth being developed in the neighbourhood of bone, or in some organ where enchondroma is wont spontaneously to arise.

If the elements constituting these malignant diseases be not characteristic, the malignity is due to the fact of their simple production, from some anterior cause in the system, which may still be called a malignant diathesis; and this, as far as we at present see, appears to consist in a tendency to the production of some elementary tissues in the full-grown body where they should not exist. Thus, the blastema which should form the healthy supply for the nutrition of the various parts of the body produces instead, a number of elementary cells or nuclei, and these constitute simple or malignant growths according to their degree of development and rate of production. Such a mass of cells grows and destroys the patient, by exhausting the powers or by interfering with some organ with which it is in contact. That a malignant form of disease which produces a tumour composed of cell-growths, should be more common, and the tumour grow faster than one composed of fibre, is reasonable from its simpler nature; and, therefore, that such *par excellence* should be called malignant, is not remarkable; nor that if the seeds of it should be carried to any other part, that they would there also rapidly increase. If, again, from some cause, whether that be in the diathesis or in the part first excited to action, the new growth should be of a fibrous character, we see with some degree of reason why it should be of slower formation than the true cancer, and why also from the fact of its approaching so nearly in structure those simple inflammatory ones which are called benignant, why this diathesis should present various degrees of malignancy in its result; and so a growth which in one instance is multiplied throughout the body, in another instance merely returns at the spot where it is extirpated. As it is extremely possible that in these two cases the malignancy is only a question of degree, there may also be only another degree between a recurrent fibroid tumour and one which never returns after removal. Again, it does not seem remarkable that a growth on the surface of the body consisting of a mass of epithelial cells, evolved from an epithelial surface, should be generally confined to that part or remain local; for, though a cell may grow and propagate in any part, or even a fibrous structure do the same, yet an epithelial cell takes root with greater difficulty; and thus, if propagated, it is only by contact, and to the neighbouring organs, or even if seen in the viscera, as the lungs, or liver, the cells are abortive, or have only imperfect resemblance to epithelium. Malignant, osseous, or cartilaginous tumours, we believe, depend, as before said, on the same cause which gives rise to cancerous or fibrous tumour, but possess their character from being

produced in the neighbourhood of bone, and retain the same if repeated throughout the system; and although this origin is not always true of cartilage, yet even this has its beginning where enchondroma is wont to arise.

This method of regarding cancer must necessarily alter many of our older opinions respecting the disease. It has generally been regarded as a specific morbid element which, having once entered the body, dooms its victim to inevitable destruction, and this often by its mere presence in the system, and without any very great impairment organs. This view, however, is seen by experience to be erroneous, although the fact still remains true that the disease is as fatal as ever, and depends upon some latent idiosyncracy. Although we may very well believe that there exists a cancerous diathesis, yet that that may destroy the subject in which it is present, without any local manifestation of its presence, is without proof. There has been a kind of loose belief in this opinion, and that cancer is something foreign to the body as much as a poison; and having seized upon its victim, may possibly destroy it before any vital organ is injured by it. So much, indeed, has this been the belief, that if a patient has had a tumour, and its nature uncertain, the aspect or wasted appearance was sufficient to decide its cancerous nature, or if another patient should seem to be wasted without any tangible cause, a latent cancer was suspected. All our individual facts, of which we have great abundance, tend to disprove this, and show that cancer kills either by the drain on the constitution, or by its encroachment on some important organ, most frequently the latter, and the symptoms have reference to imperfection of function of that organ, rather than to the presence of the cancer. Thus, patients with cancer of the stomach, or of the parts in its neighbourhood, by which constant vomiting is set up, are subject to an extreme wasting; but such would be equally the case if such organs were affected by tubercle or simple inflammatory affection, which interferes with the chylopoietic function and the general nutrition of the body. This is proved by the marasmus of children, and the not uncommon cases in adults, where a simple inflammatory process, by involving important organs, has produced the most wretched emaciation, although diagnosis of cancer was unquestioned; and, indeed, in the so-called scirrhous pylorus, in its simplest form, the emaciation is extreme, and yet the disease in many cases is far from being proved to have a cancerous origin. On the other hand, patients who die with cancer in less vital organs, do not necessarily waste, nor if the disease attacks external parts; for in such often a superabundance of fat is found. No surgeon, indeed, looks necessarily for wasting in his cases of cancer of the breast; on the contrary, the subjects of this disease are often seen to be remarkably fat, indeed the *post-mortem* examination of fat patients who have died of cancer is of almost weekly occurrence.

Had space allowed we should have liked to have adduced some more

facts which tend to show that many of these forms of new growths are linked to each other, and in many cases do not admit of any line of distinct separation; just as the recurrent fibroid, which, both in its clinical history as well as in its anatomical nature, takes its place between the simple fibrous and the true carcinomatous tumours. In a case, which lately occurred at Guy's, of scirrhous pylorus in a young woman, the disease had been of four years' standing, accompanied by all the usual symptoms; but the *post-mortem* examination showed the adventitious thickening to be due to simple fibrous growth in the submucous tissue, associated with a fibroid hardening of the neighbouring glands. Also another case where, with a similar condition of stomach, the liver was filled with a number of nodules presenting a carcinomatous appearance, but which were as hard as cartilage; and a microscopic examination presented merely a well-formed reticulated fibre-structure without any cells. There would have been a question as to the propriety of calling this cancer, had not tumours been found in both breasts, presenting the appearance of scirrhous disease, although even here the microscope showed mainly fibrous structure, associated with a few small oval nuclei. It might, therefore, be doubted whether scirrhous disease of the breast does not present varieties; and that some, like the present, consist of little more than an atrophied organ with a small development of fibro-cellular tissue.—*Guy's Hospital Reports, Vol. III.*, 1857, *p.* 144.

48.—ON RESECTION OF LARGE JOINTS.

By one of the writers of the British and Foreign Medico-Chirurgical Review.

The Shoulder-joint.—Resections of the shoulder, unlike those of the knee, generally necessitate the removal of but one of the articular extremities entering into the joint; it is very seldom that more than the head of the humerus need be removed, either for disease or injury, and this from the very nature of the affections of the joint, which, while they seriously damage or even destroy the head of the humerus, rarely attack the glenoid cavity of the scapula. Again, the exposed position of the humerus, which renders this bone so peculiarly liable to injury from gun-shot wounds, forms a protection for the scapula. Fortunately, the full benefit of resection may be secured by the removal of one articular extremity, as it is not our object to obtain bony ankylosis.

This operation is applicable to compound dislocations, to cases where a bullet may have lodged in the head of the bone, and to all wounds of the shoulder-joint complicated with crushing or fracture of one or both bones entering into the articulation, unless, of course, the severity of the injury, by division of the great vessels, or by extensive laceration of the soft parts, necessitates ex-articulation of the limb. Nor need

the extension of the injury to the shaft of the humerus deter the surgeon from attempting the operation. During the Schleswig-Holstein war, in more than one case, as much as four or five inches in length were removed from the shaft of the bone, and that with the most complete success.

In disease, either one or both articular extremities of the joint may be removed for caries, or indeed for any other incurable affection of the articulation, which renders it not merely useless as a joint, but by its presence either destroys the utility of the whole extremity, or seriously affects the general health of the patient. Lastly, this operation may be substituted for ex-articulation, in cases where tumours affecting the head of the humerus do not by their extension to the shaft necessitate the removal of the entire limb. We apprehend that resection of the joint is by no means justifiable for mere ankylosis, provided that this is the only inconvenience the patient suffers from. The movements of the fore-arm and the rotation of the scapula compensate so considerably for this, that we cannot see the necessity for the operation. The operation is counter-indicated where, together with compound fracture, there is any excessive destruction of the soft parts, or injury to the great vessels or nerves. Neither should cases of necrosis or caries be submitted to operation, unless the disease be confined to the articular extremity of the bone, or at any rate be within reach of removal.

The objects of this operation are to restore to the patient a strong, painless, and, if possible, a movable articulation; and these results are best secured by a careful selection of suitable cases, a well-planned operation, and appropriate after-treatment.

The object of any mode of operation must be the sufficient exposure of the joint, with the least possible injury to the parts about. It appears, from the history of former operations on this articulation, that though Park, White, and others had adopted a single longitudinal incision for the removal of the head of the humerus, yet previous to its performance by Professor Langenbeck, the long tendon of the biceps had always been divided. He it was who first practised an operation which had for its object the preservation of this tendon. Langenbeck's method consists in an incision commencing at the acromion, and extending downwards on the anterior aspect of the joint for three or four inches; this should fall just over the bicipital groove, which is then opened, and the tendon drawn inwards; the muscles inserted into the tuberosities are now divided, and the head of the bone thrust out of the wound and removed by an ordinary saw. This operation is sufficiently easy of execution when the head of the bone retains its connexion with the shaft, and the soft parts are not tense or swollen. On the other hand, it is difficult by this incision to remove the disconnected head of the humerus, and especially when the integuments are swollen and œdematous. To remedy this, and to provide a more dependent aperture for the escape of the secretions from the wound,

Stromeyer made use of a semicircular incision, commencing at the posterior edge of the acromion, and extending downwards and outwards for three inches, having its concavity forwards; the joint is thus freely opened from above and behind, the tendon of the biceps can be preserved, and a free and dependent aperture is left for pus. Stromeyer states that patients recover from this operation much more quickly than from Langenbeck's, owing to the much greater facility it affords for cleansing the wound. That perfect recovery may take place after division of the tendon of the biceps is well known, and indeed Esmarch relates three cases of resection in which it had been torn across by a ball, and yet in each case the patients recovered, with good use of their arms. It may also be gathered from similar evidence that transverse division of the fibres of the deltoid but little affect the ultimate success of the case. Whatever mode of incision be adopted, the deltoid, with few exceptions, becomes much atrophied after the operation; perhaps this is caused by the division of its nerve, which, with the posterior circumflex artery, are the only nerve and vessel of importance that are liable to injury.

The after-treatment of these cases is far more simple and more easy of execution than that of excision of some other joints. Absolute rest, cleanliness, and appropriate constitutional support constitute the principal measures to be adopted; but we will refer to the plan pursued during the Schleswig-Holstein war. Absolute quiet was maintained by bandaging the arm to the side. Ice was freely applied to the parts, and maintained there until suppuration was fully established. Bleeding, both constitutionally and locally, was unsparingly employed during the stage of reaction, and upon this Stromeyer strongly insists. The wound was never, if possible, disturbed, all cleansing was effected by allowing water to flow over the wound. Matter, if it formed, was let out by incisions, and not squeezed out. Cicatrization was promoted by dressings of nitrate of silver lotions; flannel bandaging was employed to consolidate the parts; passive motion was commenced as soon as the cicatrix had formed, and was continued at the discretion of the surgeon, and as the patient could bear it, until considerable voluntary motion of the extremity had been regained.

The Elbow-joint.—Among the larger articulations, there is none to which the operation of resection is so admirably adapted as to the elbow. Compared with other joints, our more extended experience of the safety of *this* operation, its general freedom from a protracted convalescence, and the brilliancy of its results, justify our performing it on the elbow, as a cure for disease, or as a substitute for amputation in cases of injury, with but little apprehension of danger to the patient's life, or little doubt of obtaining a successful issue. "In short," says Mr. Butcher, "those trembling and sceptical about the propriety of the more severe excisions of the hip, knee, and wrist-joints, yield their allegiance and assent tacitly in favour of excision of the elbow, and allow unsullied its accredited merits."

The elbow-joint, in cases of injury, may be resected in part or entirely, for gun-shot or other compound fractures affecting it, where the injury to the bone is too extensive to permit of extraction of the fragments, and where no extensive destruction of the soft parts or lesion of the great vessels necessitates amputation.

It is also applicable to those cases where bullets have lodged in either of the articular extremities entering into the joint, and no less to cases of compound dislocation where the most favourable result of the expectative plan of treatment will but restore a stiff joint to the patient. It is in the elbow-joint alone that we are justified in applying resection as a cure for simple ankylosis; and here any such condition of the joint, either the result of injury or disease, which so impairs the usefulness of the upper extremity as to prevent the sufferer from gaining his livelihood, is without doubt a case to which excision is applicable, provided that the patient is desirous of submitting himself to the operation.

In cases of disease, excision of the elbow may be practised with great success for caries or necrosis of any of the joint ends of the articulation, and indeed for any affection of the synovial membrane or articular cartilages which renders the joint useless and is beyond our curative aid. Carious disease or necrosis of any considerable portion of the shafts of the bones of the fore-arm and humerus, or fractures which extend for more than four inches either above or below the articulation, all alike forbid resection of the joint. By performing the operation in these cases, or in any other to which it is inapplicable.

"Either the wretched sufferer may be doomed to mutilation for life, or resection, a most valuable operation, may be brought into discredit by its performance where not at all suited, and where it was never intended by its warmest supporters."

"Again, it should be remembered that a patient may not have the power to bear an amputation after failure by an ill-advised resection, when he might have made a good recovery from amputation if performed at first."

The condition of the integuments in long-continued disease of the joint—we mean their swollen, sodden, and inflamed state—need form no obstacle to the performance of this operation; this quickly subsides on removing the real cause of the disease.

The object of this operation, in the case of the elbow-joint, is to restore, if possible, a thoroughly movable articulation, such an one as is fitted for all the ordinary avocations of life; but if mobility is unattainable, a firm ankylosis at a suitable angle is the most desirable result. As in resecting the shoulder-joint, it is not necessary to remove all the joint-ends entering into the articulation, though one would have supposed that recovery would be expedited by the removal of the opposed cartilaginous surfaces. Stromeyer gives it as his opinion, and that the result of experience, that it is of no advantage purposely to destroy the articular cartilage.

The rule of practice, in this respect, in the Schleswig-Holstein war, appears to have been either to resect the articular extremities of both radius and ulna, or only the end of the humerus; of course, where the severity of the injury required it, all the joint-ends were removed. In no case was it thought expedient to leave the opposed ends of the bones in contact after the operation; this later proceeding results, as one might expect, in bony ankylosis. Stromeyer maintains, in opposition to Esmarch, to whose opinion we have just alluded, that the presence or absence of ankylosis is chiefly dependent upon the plan of after-treatment adopted by the surgeon: and, indeed, from the perusal of Esmarch's table of forty cases of resection of the elbow-joint, it appears that the amount of bone removed but little affects the ultimate mobility or stiffness of the arm. In one case related, four inches of the end of the humerus were removed, and still no movement of the joint was ultimately obtained, and yet another case is given where all the joint-ends were resected with the same result; again, from a third patient, four inches and a-half were removed from the end of the humerus with a directly opposite result, great mobility being eventually obtained. In fact, so anomalous are the results in this respect, of removal of more or less extent of bone from the articulation, that we are inclined to believe with Stromeyer, that judicious after-treatment chiefly contributes to the restoration of a movable joint. Esmarch strongly condemns partial resection, or the removal of broken fragments of bone from the articulation, and in proof of this opinion he quotes two cases of Stromeyer's where this plan of treatment was adopted: in one, the external condyle alone was removed, in the other, only the olecranon; both cases were followed by secondary abscesses in the neighbourhood of the joint, and after a tedious convalescence of four and seven months respectively, both patients recovered with bony ankylosis. In oblique compound fractures of the bones of the elbow-joint, it was found sufficient to truncate the projecting angle of bone, and not necessary to cut through the shaft so as to include the whole of the fractured surface; in this way many cases were successfully submitted to operation which otherwise would have involved too great a loss of bone to allow of subsequent repair.

In all the various plans of operation for resection on the elbow, the main object to be attained is the sufficient exposure of the bones without injury to the ulnar nerve, or undue division of the soft parts around the joint; the ulnar nerve is to this joint what the tendon of the biceps is to the shoulder in the operation for resection; though the preservation of the nerve is of much greater importance, yet neither nerve nor tendon should in either case be divided.

For performing the operation under consideration, various plans of incising the integuments have been adopted; those most in use at the present day are the H-shaped incision, used by Mr. Syme; Liston's mode of operating, and Langenbeck's. In the H-shaped incision, the longitudinal cuts run at the back of either condyle, and are connected

by a transverse division of the integuments just above the olecranon. Langenbeck's operation consists in a single longitudinal incision running down the inner side of the posterior part of the joint, just to the radial side of the ulnar nerve; the joint is opened, and the soft parts and ulnar nerve are dissected *en masse* from the subjacent bone; the coverings of the joint on the outer side are in the same way separated, the lateral ligaments divided, and the ends of the bone thrust out by flexion. Of these two modes of operating, the former, without doubt, fulfils the great object of the undertaking—viz., the free exposure of the joint-ends; but it does this in an unnecessary degree, or rather, sufficient exposure may be attained by less extensive division of the soft parts. Langenbeck's method of operation, on the dead body or on an arm where the integuments are in a healthy condition, will with little difficulty quite sufficiently expose the joints; but in an arm where the integuments are tense and swollen, it does not accomplish this to the requisite extent. We have ourselves seen, in an operation for disease where the soft parts were in their usual state of tension and succulence, the outer flap tear transversely, owing to the great strain upon it in drawing it aside to bring the joint fairly into view. In our opinion of Langenbeck's operation, we are supported by Esmarch, who says of this proceeding,

"As soon, however, as considerable serous or inflammatory infiltration has come on, as generally occurs after gun-shot injuries, it is necessary to lengthen this incision too much, to prevent tearing and bruising the skin."

And for this reason it was that, in the Schleswig-Holstein campaigns, Liston's operation was generally adopted. Out of forty cases, Langenbeck's operation was put in practice three times, while Liston's was employed in twenty-seven cases. This latter operation consists, as is generally known, in a -| shaped incision. The longitudinal cut is commenced above the olecranon, between it and the ulnar nerve, and is continued downwards for three inches or more, along the ridge on the back of the ulna; a transverse incision is now made across the radio-humeral articulation, which joins the first at its centre; by this the joint is opened, a hook or a finger is placed within the joint, and used to retract the soft parts with the ulnar nerve to the inner side; this is facilitated by separating them with the knife from the surface of the bone, taking care to carry with them as much periosteum as it is possible to procure; the lateral ligaments are divided, and the heads of the bones turned out by flexion. In this operation the ulnar nerve runs but little risk of being divided, as, in separating it from the bone, there is the capsule of the joint, the lateral ligament, and its own sheath to defend it from injury,—in fact, the nerve should not be seen during the whole operation. In gun-shot fractures, however, the existence of bullet wounds often necessitates the deviation from any rules of operating, and obliges the surgeon to make a skilful use of existing apertures by including them in the line of his incisions.

In this operation, although the preservation of the ulnar nerve may appear to be easily attained, provided ordinary care be exercised, yet we have recognised its division by the subsequent loss of sensation, when at the time of the operation it was apparently uninjured, and indeed was not seen throughout; that union may take place and sensation be restored, even after its division, is well exemplified in a case related by Mr. Syme, where, although it was divided at the time of the operation, the patient subsequently regained sensation and voluntary motion in the parts supplied by it. If possible, in removing the ends of the bones the insertions of the brachialis anticus and biceps should be preserved, as their integrity adds much to the strength of the future articulation; still, the removal of the coronoid process and the tubercle of the radius has often been effected with the ultimate restoration of a useful joint.

The Wrist.—We pass from the consideration of resection of the elbow-joint, to the less favourable and indeed almost discouraging results of the same operation on the wrist. In all operations for excision, a general and indispensable condition must be fulfilled—namely, that together with the partial or complete removal of the articular extremities of the bones, there should be a free exposure or destruction of the synovial cavity of the joint; any operative proceeding which leaves the articulation in a condition approaching to that of a wounded joint will lead to no good result, but will rather thenceforth be exposed to the dangers attendant on joint wounds, and will terminate as such accidents are wont to do.

In excisions of the wrist, owing to the complexity of the joint, it is seldom that we can fulfil these conditions; in removing disease here, while we take away the carious bone, or destroy the useless joint, in all probability we partially open or puncture one of the neighbouring articulations, which may be healthy or otherwise, and thus we leave a wound from which the subsequent phenomena of inflammation, profuse suppuration, and ulceration of the cartilages will but too surely result. There are other, but minor, objections to this operation, such as the difficulty of its performance, and the injury to the tendons which is often unavoidable, though these form no serious objection to the operation. Moreau the younger seems to have been the first to perform this operation on the wrist; the result he reports as successful, but we have been unable to meet with any distinct history of the case. In 1849, Heyfelder operated on the same articulation with equal success; five years afterwards this patient had regained perfect use in the hand and fore-arm, a result but rarely attained in similar cases; more recently the operation has been performed by Messrs. Fergusson, Stanley, Erichsen, and others.

In operations on the dead subject it is sufficiently easy to remove the extremities of the radius and ulna without injury to the tendons or vessels in the neighbourhood, and indeed this has been accomplished by more than one surgeon on the living body; but very often, in

disease, it is impossible, and indeed useless, to attempt to save the extensor tendons, matted together as they may be by inflammatory deposits, and closely adherent to the bone. The principal modes of performing this operation are three:—1st, by lateral longitudinal incisions running along the ends of the radius and ulna respectively; 2nd, by a semilunar or conveniently-shaped flap, formed from the back of the wrist; and 3rd, by making two long incisions, the one in the palm, and the other on the posterior aspect of the joint. This latter operation has been performed by Mr. Simon, but we should imagine that the great length of the incision would form a serious objection to this method. By the first and last modes of operation, the tendons may without difficulty be saved; whereas, by forming a flap on the dorsum of the hand, though a good view of the joint may thus be obtained, yet some of the extensor tendons will necessarily be divided. Mr. Butcher maintains, with great justice, the importance of avoiding, if possible, any interference with the carpal articulation of the thumb, or its extensor tendon. This he effects by commencing his incision just to the ulnar side of the tendon of the extensor secundi internodii, cutting a semilunar flap from the back of the wrist, and ending his incision on the ulnar half an inch higher up the fore-arm than the point where it commenced; thus the extensor tendons of the fingers only are divided, while those of the thumb are turned aside; this operation has also the advantage of being easy of execution in nearly all cases.

Resection as applied to the wrist is justifiable in young patients, as a substitute for amputation in caries, or in cases of general destructive synovial disease; it has also been performed with success for osteoid disease of the carpal end of the radius. Probably, the cases to which it is most applicable are those of compound dislocation of one or both bones of the fore-arm, where the protruded portions of bone may be sawn off with a good prospect of success.

The Hip-joint.—This bold and hazardous operation was first recommended by Mr. Charles White, of Manchester, in 1769, whose suggestion was put into practice by Mr. A. White, of the Westminster Hospital. He in 1818 excised the head of the femur for carious disease, with a more fortunate result than has since attended many operations on the same articulation. Subsequently, in 1844, Mr. Fergusson excised the head of the bone for caries with equal success, after having, as he says, meditated for more than ten years the performance of this operation, without meeting with a single case in which its execution could be deemed justifiable.

Excision of the head of the femur is, without doubt, best adapted for those cases of disease of the femur where the carious head of the bone, having suffered spontaneous dislocation, lies as a foreign body on the ilium, and by the irritation it causes, endangers the life of the patient. Such cases resolve themselves into ordinary operations for necrosis or caries, and can scarcely with justice be called excisions of the hip-joint.

Less hopeful are the results of this operation, when undertaken for disease of the head of a bone which lies yet in the acetabulum, and still less encouraging are the cases where it is performed for general caries of the articulation—i.e., where both pelvis and femur participate in the disease. In no case is it justifiable unless the life of the patient is in danger from the excessive discharge or from the irritation of the carious head of the bone.

It should be undertaken in no case as an operation of expediency, but only when absolutely necessitated by the constitutional condition of the patient, and by the incurability of the local disease. In the most favourable cases, when the patients are young and otherwise healthy, the bone dislocated, and the pelvis free from disease, we may hope not only to save the patient's life, but to restore to him a useful and movable limb. Still in many cases, and especially in those of gun-shot fracture, in which it is no less our duty to perform this operation, we can only afford to the patient an uncertain chance of escape from certain death.

It is only applicable to injuries, when the head or neck of the femur is broken by a musket-ball of moderate dimensions, in such a way as to implicate the joint. Extensive fracture of the pelvis or injury to the great nerves or vessels, of course forbids the performance of the operation.

The head of the thigh-bone may be removed without any considerable difficulty, and it is usually done from the posterior and outer side of the joint. A longitudinal, semilunar, or crucial incision over the great trochanter, will in all cases sufficiently expose the parts without any danger to the great nerves or vessels. The head of the bone can be thrust out of the wound by rotating the knee inwards, when it can easily be removed by forceps or an ordinary saw. Mr. Guthrie advised, that in cases of doubt, where the extent of the disease or injury is unascertained, the incision should be made in such a way that should it be necessary, exarticulation may be performed by extending the first wound. This may easily be attained if the joint is exposed by an incision from the anterior superior spine of the ilium downwards to the great trochanter. We have ourselves seen this plan of operation adopted with good success.

It has been a subject of much discussion in this country as to whether, when both pelvis and femur are diseased, such a case is a fit subject for operation. Hitherto, surgeons have generally agreed that an extensively diseased acetabulum, or a pelvic abscess, if ascertained, was a good and sufficient reason to abstain from resecting the diseased joint, choosing rather to allow things to take their course, than to subject the patient to what was considered in such cases the gratuitous cruelty of the operation. In opposition to these views, Mr. Hancock, in his recent article on the subject, thus expresses himself:—

"In deciding on this operation, we should be guided by the condition of the patient, and not by any arbitrary stages of the disease;

and whilst I always have, and still continue to deprecate unnecessary ill-considered operations, I believe it to be our duty, when we have assured ourselves that a case is one of hip disease, that the patient is dying, and there is no hope of saving him by the ordinary means, to perform, or at all events propose, the operation—without reference to whether, pathologically speaking, the disease be in this or that stage, or whether the head of the bone be dislocated, the acetabulum healthy or not."

In support of this opinion, Mr. Hancock asserts that rarely, if ever, is the acetabulum entirely free from participation in disease with the femur. In nineteen out of the twenty-seven operations performed, the acetabulum afforded more or less evidence of disease at the time of the operation. In two there was scarcely a trace of acetabulum. In three the acetabulum was filled with a fibro-gelatinous mass. In six the gouge was employed for caries. In three it was perforated, and in the others it was more or less affected. After all, it is only in a very few instances that the surgeon can tell beforehand what is the state of the cotyloid cavity; and this uncertainty is of less importance if Mr. Hancock's views on the subject are correct. So far from perforation of the acetabulum being a barrier to the operation, that gentleman maintains that even under these apparently unpromising circumstances, excision may be performed with safety and benefit. In support of his opinions, Mr. Hancock brings forward his own case, where, from a boy, aged fourteen, suffering from carious disease of the whole joint, with pelvic abscess, he removed the head and neck of the femur, together with the floor of the acetabulum. The operation was followed by almost instant relief of his constitutional symptoms, and at the end of five weeks he could walk with a crutch and a stick. In only two instances recorded was the result of the operation immediately fatal; in most cases, whatever the ultimate effect of the proceeding, the immediate consequences were relief from pain, and a marked improvement in the constitutional symptoms.

It is but seldom that a case presents itself in military surgery to which this operation is applicable; the position of the head of the femur, deeply buried in muscles, surrounded by the acetabulum, and having the great vessels of the limb on its anterior aspect, renders an uncomplicated injury to the head or neck of the bone very rare.

The Knee-joint.—Mr. Butcher, the able and distinguished champion of resection of the knee-joint, by his valuable memoirs on the subject has left little to be desired, either in the collection of cases, or in the analysis of their results. Time only can add to our knowledge on this subject, by testing the permanency of the cure effected by the operation; and additional experience may guide us more correctly in our choice of cases, by teaching us the comparative advantages of the operation in the various affections of the joint.

The operation is only recommended, even by its strongest supporters,

as a substitute for amputation in certain cases, and not as an operation of expediency. It may be performed as a substitute for amputation in any disease of the cartilages, synovial capsule, or articular extremities, which either by its severity endangers the life of the patient, or is in its nature incurable. Thus it has been put into practice with success by Dr. Buck, of the New York Hospital, in a case of angular ankylosis of the knee. On the other hand, just as in the case of the other joints, the disease, if of the bones, must be limited to their articular extremities; while of course visceral disease, or extreme age, alike preclude the performance of the operation.

This proceeding has but rarely been put in practice for injuries of the joint; indeed, it is seldom that the knee is exposed to an accident sufficiently severe to justify resection, which is not at the same time so dangerous to life as to necessitate amputation. It may, and has been, performed for gun-shot injuries to the articular extremities of the bones forming the joints, or for wounds of the capsule where the articular surfaces of the bones are bruised or lacerated by the bullet. It has also been put in practice with success in a case where, from an old fracture of the patella, with great separation of the fragments, the leg became useless, and mechanical appliances could not be worn.

The object to be attained by this operation is to free the patient from an incurable and often fatal disease, and to restore to him the power of progression, by giving him a firm and unbending, though shortened, limb, which shall have its axis of motion at the hip-joint. In fact, this operation, if successful, effects all that amputation can do; and in addition, while it endeavours to save the patient's limb, it is said to expose the sufferer to no greater danger of his life than amputation.

The various modes of resecting the knee-joint resolve themselves into two principal methods: first, the H-shaped; and second, the semilunar form of incision.

In the first operation, an incision three or more inches in length is made on either side of the joint, opposite the lateral ligaments, and these are joined by a transverse cut, extending across or below the patella, which bone is either thrown up in the flap, or removed, according to circumstances; forcible flexion is then used, and the lateral ligaments divided; the posterior part of the femur is carefully freed from its ligamentous covering; and with an ordinary saw the articular surface of the bone may be removed, first from the femur, and then from the tibia. The second mode of operating consists in forming a semilunar flap, with its convexity downwards, commencing just above one condyle of the femur, extending across the joint below the patella, and ending at the opposite condyle; the subsequent steps of these operations are the same in both cases.

There is yet another plan of excising the joint-ends at the knee, which was originated by Mr. Jones of Jersey, and has for its object the preservation of the ligamentum patellæ. It consists in forming

two lateral longitudinal incisions, with a transverse connecting cut across the head of the tibia; the flap thus formed, of the integuments only, is thrown up, the synovial capsule cut through, and the patella with its ligament drawn to the inner side while the joint is in an extended condition; forcible flexion should now be used, the lateral ligaments divided, and the articular surfaces sawn off.

This operation, though admirable in its design, must at all times be difficult of execution, and in some cases impossible, though its performance may be much facilitated by the use of Mr. Butcher's ingenious saw. Indeed, Mr. Jones thus speaks of his operation:—"There are cases in which it is altogether inadmissible, and I feel persuaded that whoever adheres to one mode only, will often find himself wofully disappointed in the result."

To secure the general object in view—viz., bony ankylosis—it is in all cases necessary to remove the articular surfaces of both tibia and femur, whether diseased or not. The condition of the patella, as disclosed during the operation, will determine the course to be pursued with respect to this bone; any small and circumscribed spots of caries may advantageously be removed by the gouge, for in all cases healthy surfaces of bone should be left in contact.

In resecting joints, the seat of the particular affection known as "pulpy synovial disease," it is doubtless of great importance (as suggested by Mr. Humphry) to remove, if possible, all portions of the degenerated synovial membrane, as its presence in the wound cannot but prolong the subsequent suppuration and retard the healing processes. After removing the portions of bone from the articular extremities, much difficulty has occasionally been found in bringing the femur and tibia in apposition, and in maintaining the whole limb in a right line; to obviate this, Mr. Hutchinson has suggested the division of the hamstring tendons, a proceeding fully justified by the vital importance of the end in view. Heyfelder recommends, that even if the limb cannot at first be placed in a straight position, it should be put upon a splint, and a day or two afterwards straightened, when the muscles will be found to offer less resistance. In proof of this he quotes a case where, ten days after the operation, the limb could be straightened which had hitherto resisted the efforts made to place it in a proper position. Five days afterwards this patient died of pyæmia. We cannot but disagree with Heyfelder in this plan of practice, deeming it, as we do, of the highest importance that the limb be placed at the time of operation in a proper position, and there maintained until it no longer requires artificial support.

In no other resection is the after-treatment of such importance as in resection of the knee; on this point Mr. Butcher justly insists, and urges the personal superintendence of the surgeon in all the subsequent dressings and shifting, which should be few and far between.

A well padded McIntyre splint behind and a long Liston's thigh splint outside, are almost indispensable to the well-doing of the case.

The former should be applied before the patient leaves the operating-table, and the latter on his removal to bed. After no operation is the judicious administration of stimulants and opiates, together with a skilful management of diet, more necessary than after this; indeed, in reading over any number of cases of recovery from this operation, though a few patients seem to suffer but little from the immediate effects of the operation and subsequent suppuration, yet in the many cases one cannot but be struck with the fact, that where the event was successful, the after-treatment showed a well-contested and hardly-won struggle between the surgeon on the one hand, and the flagging powers of the system on the other.

The Ankle-joint.—Excision of the ankle-joint, originated by Moreau, strongly advocated and successfully practised by Sir Astley Cooper, has in these days, for some insufficient reason, met with but little countenance; and in comparison with the effects of the same operation on the knee, its advantages seem to be by no means adequately appreciated. Resection is applicable to the ankle-joint in its diseases, but still more so in its injuries, and this both on account of its structure and position. The synovial cavity of the ankle, unlike that of the wrist, may be laid open or destroyed by operation, without implicating the surrounding articulations; there is less danger here of inflicting an injury on a neighbouring joint, and of setting up a disease no less severe than that for which the operation was undertaken. Again, after removal of the articular extremities, the appearance of the wound contrasts most favourably with that left after resection of the knee-joint, where the exposed surfaces of bone are very extensive, and the cavity of the wound large and deep. In addition to this, the position of the ankle-joint, far as it is from the centre of the circulation; while, on the one hand, it is perhaps unfavourable for the healing process, yet, on the other, it enables us to put excision into practice with but little danger to the patient's life; indeed, we are not acquainted with a single case where the operation was followed by fatal consequences.

The diseases of the joint under consideration present considerable difficulties in the diagnosis of their extent; it not only requires great care to decide whether the disease is entirely limited to the tibio-tarsal articulation, but it is sometimes nearly impossible to distinguish between caries of the astragalus and the same disease of the os calcis. For this reason it is, as well as on account of the great difficulty of exposing the articular extremities when the bones are in their normal position, that the operation is best adapted for injuries of the joint, and especially for compound dislocations. In these the amount of mischief is more easily ascertained, and the protrusion of the bones, rendering their section easy, obviates the greatest difficulty of the operation. Sir Astley Cooper, in speaking of the compound dislocations of this joint, states that he knew of no fatal case where the operation was performed, though he had met with several where it was not put in practice.

Resection may be substituted for amputation in any synovial or carious disease of the ankle-joint which does not extend among the other tarsal articulations, or involve any considerable portion of the shafts of the bones of the leg. It may be performed in rare cases of gun-shot wounds of the joint, with fracture of the bones; but in these accidents there is too often such considerable injury to the soft parts and vessels as to demand amputation.

In performing the operation on this joint, there is said to be no absolute necessity for removing the opposing cartilaginous surfaces: in diseases, the affected surface of bone should be sawn off; in injury, the protruded or fractured portions of bone need only be excised. Many instances have occurred where, after sawing off the protruded ends of the tibia and fibula, the cartilaginous surface of the astragalus has been left untouched, and with the happiest result. In this particular we cannot but notice the much greater proneness to ulceration displayed by the articular cartilages of the long bones entering into the knee-joint, where exposure of the cartilage but too surely leads to its ulceration and separation; still we have no doubt that the safest course, and that which is most likely to promote recovery, is to remove the cartilaginous surfaces of the joint, whether healthy or diseased.

The plans of incision used for excising this joint have been various, having for their object the adequate exposure of its cavity without injury to the tendons; this can be best accomplished by the operation recommended and described by Mr. Guthrie in his Commentaries, to which we refer the reader, as the limits of this paper will not permit us to transcribe it. After the operation, the limb may be best secured on a back splint and foot piece, having movable sides, which can be let down to wash and dress the wound.—*British and Foreign Medico-Chirurgical Review, Oct.* 1857, *p.* 289.

49.—*Swing Apparatus after Excision of the Hip-joint.*—The principle of the swing treatment for fractures, &c., certainly finds its ultra-development in its application to cases of diseased hip-joint. One case at least may, however, be seen at present in King's College Hospital in which it is so employed. Mr. Heath, the House-Surgeon, at whose suggestion, and under whose management it has been employed, informs us that very great benefit has been obtained. The mode adopted is that of Salter's swing, the apparatus being made strongly, and the entire body suspended. The wound is left uncovered, excepting by the dressings, and thus a depending escape for the discharge is secured. The great advantages are that there is no necessity to disturb the patient in order to allow of the evacuation of the bowels, and the accumulation of discharge in and about the wound is altogether prevented. But little attention is paid to the position of the thigh, provided that it be comfortable to the patient, and that it be not allowed to remain too long in the same, as the object is to

secure ligamentous union and a movable limb. We are not aware that the swing has yet been employed in the case of any adult person. —*Medical Times and Gazette, Aug.* 22, 1857, *p.* 195.

50.—ON THE TREATMENT OF FRACTURES OF THE THIGH.

By Dr. J. H. Hobart Burge, Surgeon to the Brooklyn Central Dispensary, New York.

[The apparatus contrived by Dr. Burge for the treatment of these cases, is intended to remove, as far as possible, the disadvantages possessed by the ordinary straight apparatus—namely, the pressure caused by a perineal strap, the strict confinement necessary, and the moving away of the patient's hips from the proper line, owing to the sinking of the bed. He says :—]

Our observations and experiments have led us to the following conclusions :—1. That the straight position is preferable in a large majority of cases. 2. That it is entirely unnecessary to confine any part of the body except the fractured limb and that to which it is immediately articulated, viz., the pelvis. 3. That the pelvis should be so secured as not to be liable to lateral motion, or to sink in bed. 4. That the groin is not a suitable part for the counter-extending pressure to fall upon. 5. That the tuberosities of the ischia are proper points for such pressure. The correctness of these principles seems to us too obvious to require argument. We shall, therefore, spend no words upon them, unless they are called in question, but proceed at once to speak of our method of reducing them to practice.

First, then, in general terms, we retain the straight splint of Desault at its original length, that is, from the crest of the ilium to several inches beyond the foot, and make the extension in the usual way, by means of the screw, adhesive plaster, and roller. We discard the hitherto excellent modifications of Physick and Gibson, not only because they confine the chest, and prevent that freedom of motion of the upper part of the body, which is so essential to the comfort of the patient, but because we obviate the necessity of such confinement, by securing the pelvis, as already intimated, against all lateral motion, and, also, against the possibility of sinking in the bed. In order to prevent the pressure in the groin, we attach the counter-extending pads, and straps, by one end to a cushioned platform, upon which the hips of the patient lie, and, by the other, to a transverse horizontal rod, above and in front of his body, while we fix the upper end of the long splint at a point opposite the side of the pelvis, and independently of all direct connection with the counter-extending pads, or straps. To be a little more explicit, our apparatus consists of two short mattresses, occupying respectively the upper and lower portions of the bed, and also of a central portion, upon which rest the hips of

the patient. This central portion is composed of the following parts: 1. A firm, but easy, hair cushion, upon which the hips of the patient lie; this cushion is secured to a board, one foot wide and two feet long, which lies transversely under the body of the patient. Both the cushion and the board, present at the lower margin, a large V-shaped opening, for convenience of defecation; and in order still farther to facilitate this function, the cushioned board is elevated several inches upon a second platform, by a strip of board at each end, thus providing a shelf for the bed-pan, which is introduced through an opening formed by withdrawing a section of the lower mattress. Upon the cushioned platform, on each side of the cushion, there is a rectangular wooden slide; these slides are so arranged as to be separated or approximated at will, and, by a thumb-screw which passes through a fissure in the horizontal portion of each, they may be fixed at the desired point, so as exactly to embrace the pelvis of any patient. There is, also, a fissure in the perpendicular portion of each rectangular slide, and a screw passing through the same; one of these is to secure the upper end of the long splint, and the other for the attachment of a splint, eight or ten inches in length, both of which splints are well padded upon one surface, and may be elevated or depressed at will, in order to bring them to the level of the limb, and fixed at the proper altitude by the screws already mentioned. These splints are mutually transferable, in order to adapt the apparatus to a fracture of either thigh.

For the sake of distributing the pressure and making the patient more comfortable, we propose two counter-extending pads instead of one. These we attach by leather straps to the upper surface of the cushioned platform upon which the patient rests, and about thirteen inches apart. These straps pass under the cushion, and, becoming well-rounded pads, traverse the tuberosities of the ischia, pass between the thighs, and thence, perpendicularly, to a horizontal iron rod, at an altitude of eight or ten inches above the patient, transversely to his body, and directly opposite the perineum; this rod is supported by a perpendicular bar at either end, extending upward from the cushioned platform already mentioned.

Attached by one extremity to the horizontal cross-bar, is a rod running parallel to, and situated directly above, the thigh. The other end of this rod is supported by an arched iron bar, extending upward from the outer side of the long splint. This is designed to afford direct support to the injured limb, whenever such support is deemed advisable, and will, we believe, be of essential service in preserving the arched form of the femur. A silk handkerchief, or one or two belts of suitable width are to be passed around the limb (either internally or externally to the splints of coaptation), and fastened to the horizontal rod. When this apparatus is used, splints of coaptation

are to be applied according to the exigencies of the case, and the views of the surgeon in attendance.

In its construction we have aimed at simplicity; no surgeon of ordinary ability can fail in its application, even without directions. I mention this as a feature of great practical importance. Complicated surgical appliances can never be used except by the few.

It will be asked if this is an expensive apparatus; this, too, is a practical question, and though I must refer the reader to the advertisement on another page for full particulars, I am happy to state that thirty dollars will cover the whole cost (including mattresses); and, in this connection, it should be recollected, that the *same* apparatus is adapted to patients of every size, and to fractures of either thigh, and, also, that it is not liable to get out of order. If the counter-extending pads become worn, they are easily renewed. The bed, being composed of separate mattresses, affords an opportunity for the frequent changing of sheets without disturbing the patient, and cleanliness, as well as comfort, is still farther promoted by the space provided for defecation. The ordinary shovel-nosed bed-pan is not required, but any convenient vessel of suitable size and depth may be used to receive the fæces. The rectangular wooden slide and short splint upon that side of the pelvis corresponding to the uninjured limb, may be temporarily removed, at any time, to enable the surgeon, or the nurse, the more readily to reach any part of the patient's body for examination, ablution, friction, application of liniments for the relief of pain, &c. &c. The counter-extending pad upon the uninjured side may also be temporarily removed, should occasion require, as the use of this pad is not essential—being designed only to distribute the pressure.

Earnestly desiring that this apparatus may be of some service in lessening the anxiety of surgeons, and in ministering to the comfort of the afflicted; and confidently believing that it will enable us, in many cases, to make a more favourable prognosis than we otherwise could, we send it forth upon its mission. Many of our first surgeons have seen it in use at Bellevue Hospital. We do not feel at liberty to quote their freely-expressed opinions; they will, doubtless, speak for themselves in due time. We are perfectly satisfied to subject it to the criticism of a liberal and high-minded profession.

By courtesy of the surgeons to Bellevue Hospital, the principles set forth in the foregoing remarks have been tested in that institution; and, though the number of cases already treated is necessarily small, the results have been highly gratifying. Many distinguished surgeons, both native and foreign, have seen the apparatus in use, and we have reason to believe it has, in every instance, created a favourable impression. Both nurses and patients testify to its convenience, and to the ease with which it is borne.—*New York Journal of Medicine, May*, 1857, *p.* 324.

51.—ON RESECTION OF THE KNEE-JOINT.

By P. C. Price, Esq., Junior Surgeon to the Great Northern Hospital, &c.

[There are unfortunately many cases in which the joint disease has been preceded for some time by disease affecting the spongy structure of the extremities of the tibia and femur. In such cases as these, the removal of the articulation becomes questionable. In addition to this seat of origin, the disease may primarily begin in the synovial, cartilaginous, or fibrous structures of the joint—the ends of the bone then becoming secondarily affected.]

In by far the larger proportion of diseases of the knee-joint which have fallen under my own observation, the mischief has apparently originated in the synovial membrane; and this would appear from general experience to be the most common *locale* for its commencement. Inflammation, however, of a specific form not unfrequently attacks the spongy structure of long bones, and such inflammatory changes are characterised by symptoms which strongly indicate a scrofulous or tuberculous habit of body, and exhibit a local manifestation of the disease. Of late years many excellent pathologists have shown that this form of disease is by no means of uncommon occurrence, appearing especially in the children of the poor, who for the most part are ill-nourished and delicate, inheriting, perchance, a specific disposition from their parents, which the more readily encourages the outbreak of the disease. This morbid affection, however, is by no means peculiar to children, and I am inclined to believe that the joints of adults are more frequently destroyed in this way than is generally imagined. As far as I am aware, no surgeon, whose name is associated with removal of the knee articulation, has offered any special comments upon the pathology of this affection, as elucidating and illustrating features of interest in connection with the operation; and it may not, therefore, be devoid of advantage to inquire how far instances of this disease are amenable to the great conservative proceeding? It is, perhaps, of little moment, in considering the question, to determine whether in the majority of cases the disturbance primarily commences in the spongy texture, or secondarily implicates that structure; neither is it of importance to discuss the exact analogy of strumous deposit in bone to genuine tubercle, as the interest of the subject may be better consulted by considering the disease under the character of a morbid material which partakes more or less of the nature of struma as developed in other localities of the body.

The infiltration of the spongy structure of bone by this strumous material may be of two distinct kinds, circumscribed and diffuse; and it is all-important that these varieties be duly understood by the surgeon who lends encouragement to the modern proceeding of resection.

Firstly, with regard to the diffuse variety. The morbid process is

at its commencement ushered in by a general low inflammatory state of the open network of the bone, the surface so affected appearing congested, and of a dark red colour, owing to the medulla contained in the bony cells being mixed with blood. This condition may sometimes be recognised by the increase of temperature about the parts so involved, and by a sensation which, if not amounting to absolute pain, is sufficient to attract not only the fears of the patient but the attention of the surgeon. Both these symptoms may obtain in degree, according to circumstances; and I have noticed on several occasions that the disposition to annoyance is more marked in patients of a plethoric habit of body than in those who labour under a more sallow and cachectic disposition.

If this condition into which the affected parts have fallen be recognised, it is not impossible, by judicious treatment, to arrest the further development of the disease; but should it continue, organic changes soon follow, which rapidly involve the integrity of different structures. When this inflammatory condition is well established, the cells of the bony structure not only appear congested, but subsequently contain a substance which is more or less fatty, oily, lardaceous, or gelatinous in consistence; and, provided the morbid action has obtained to the medullary cavity, the medulla itself may become the seat of disease. The bony network itself soon becomes implicated, inflames, expands, and softens, and to such an extent, that it may easily be broken down by the slightest pressure.

This further increase of the disease is accompanied by a chemical alteration in the constituents of the bone. The earthy material, which in health forms so considerable a portion of the osseous composition, greatly diminishes, and in some instances almost entirely disappears. Not only are the parts so involved deprived of their inorganic material, but the compact structure immediately surrounding them likewise becomes affected, and converted into a mere shell, possessing apparently little similitude to normal bone. The periosteal covering also sympathises, thickens, and loosens in its attachment. When this morbid affection is confined to the extremity of the shaft, the further changes that may take place are dependent on and modified by circumstances. The disease may appear suddenly to be arrested, and to call for little aid from the surgeon. If, however, the inflammatory state of the parts has somewhat subsided, liquefaction of the tuberculous or strumous deposit may slowly and gradually take place, accompanied with ulceration, which destroys the cellular structure of the bone, and advancing towards the more compact, perforates the already thinned walls. But it not unfrequently happens that the deposition of the foreign material leads to more extensive and rapid mischief. Suppuration may supervene upon a fresh attack of inflammation, and with celerity not only destroy contiguous, but give rise to an amount of suffering and distress which affects the already debilitated constitution, and demands the adoption of decisive measures.

When either or both of these conditions have obtained, a communication with the surrounding soft tissues is soon effected. The irritating matter being voided into cellular and other structures, favours the formation of abscesses, which, when opened or bursting of themselves, admit the exit of a discharge which is composed of the softened strumous material, more or less mixed with blood, pus, and the debris of carious or necrosed bones. It would appear from the above description, that this form of disease may exist for some time, or even run its course, without including the neighbouring articulation; but, unfortunately, it is seldom that the joint escapes the destructive process. At an early period the articulation begins to sympathise, and ere long becomes seriously affected. When the first stage of the disease is well established, and the foreign material which has been deposited in the cancellous texture begins to soften, the boundaries of the joint become invaded. By changes degenerative and destructive the cartilages disappear, and permit the extrusion of the morbid contents of the diseased bone into the joint cavity. The synovial membrane, if not already involved, thickens, and greatly alters in structure; its functions are destroyed, and, instead of fulfilling its proper duties, becomes the cause of more serious implication. The ligaments, put upon the stretch by the increasing size of the joint, soften, and permit deformity and luxation to take place. The presence of irritating matter in the closed cavity soon leads to suppuration, and perforation of its walls. Thickening and abscesses include cellular and other tissues, and ere long circuitous channels are formed, with external openings, which permit the escape of the cause of so much disturbance.

Of all morbid affections, perhaps, there is no one class more difficult of correct appreciation than diseases of joints. Daily experience proves how utterly impossible it is, on many occasions, to form a right estimate of the extent to which both hard and soft tissues are involved; and to point out the exact seat of disturbance, or to diagnose the nature of the affection which calls for so serious an interference as amputation or resection.

I have not unfrequently seen limbs removed for an amount of disturbance in the joint which was deemed irreparable prior to being amputated, and more frequently I have witnessed the operation on occasions in which the amount of disease was supposed to be much more trivial than subsequent examination showed. Whenever, therefore, there is the least doubt as to the nature and extent of disease in a condemned joint, I conceive the surgeon will be but acting with discretion in first obtaining a clear view of the interior of the articulation prior to making up his mind as to the nature of the operation he is about to perform. Old prejudices must be done away with, and ancient practices expunged. The time has arrived when routine, so detrimental to the cause of humanity, must be abolished, and customs, doubtless excellent in their day, must no longer remain unquestioned. As improvements daily take place in the character of surgical instruments,

so with the improvement of the machine should be the advance in progress of the motive power.

Many, I know, will and do object to what may seem an unnecessary prolongation, and a somewhat new innovation to the steps of an operation, and will argue that such a proceeding is fraught with additional risk to the patient. But such fears are more imaginary than real. Mr. Butcher has well considered this point in his last excellent memoir, "On Excision of the Knee-Joint," and since its publication it has fallen to my lot to become acquainted with two more cases, in which the state of the joint was well examined, and actually resected in the hope of retaining to the patients useful limbs, before it was evident that amputation would be the wiser proceeding. If the patient be under chloroform, insensible to pain, separated from passing events, and under the hands of an able operator, I confess I can myself see but little additional risk that is thereby incurred.

In the memoirs of Mr. Butcher on "Excision of the Knee-Joint," several operations have been recorded as undertaken for "strumous disease of the joint." It is to be regretted that the term "strumous" is so frequently used without a more distinctive meaning. I wish particularly to make a grand distinction between diseases partaking of the character of struma, commencing within the cavity of the articulation, and those originating in the cancellous structure of the heads of the bones entering into the formation of the joints. This distinction is all-important; for I do not hesitate to say that every diseased joint, with the exception of that form arising from diffuse strumous infiltration of the heads of the two bones, is, in general, well suited for the adoption of resection in preference to amputation.

Mr. Butcher gives a short account of eighty-two cases in which the operation of removal of the articulation had been adopted. Not more than a seventh of this number are recorded as strumous, but in every one of these cases, with the exception of a solitary instance, the strumous nature of the disease would appear to have been manifested in the synovial membrane of the joint, or to have appeared in the open texture of the heads of the tibia and femur under that form which is termed circumscribed infiltration.

I have been at some pains to ascertain the pathological condition of the ends of the bones in those cases which are described as "strumous," and my thanks are due to several surgeons for the kindness with which they have answered my inquiries. The solitary instance to which I allude fell under the notice of a most distinguished surgeon, Dr. Keith, of Aberdeen. This case is so full of interest, and as yet unpublished in detail, that I take advantage of the kindness of Dr. Keith, who allows me to use it.

The patient was a man aged 33, the subject of extensive disease of the knee-joint and neighbouring bones, which had existed for eleven months. Excision was performed on March 10, 1855. "One inch and a quarter was taken off the end of the femur, and half an inch from

the head of the tibia. The bones were expanded, the interior reddish, and every cell filled with a lardaceous deposit. On sawing through the head of the tibia, an abscess in the very centre of that bone was opened, from which a tea-spoonful of ripe pus escaped, leaving a thimble-shaped cavity. Three abscesses outside and around the joint were also laid open." The account forwarded to me by Dr. Keith is so graphic, that I cannot avoid transcribing it:—

"Well, this case got every care that my skill could devise. I was dresser myself, and fought on for 222 days, and at last, to save his life, gave in and amputated the thigh on October 20, 1855; and on November 30 he was dismissed cured, and at this date (May, 1857,) commands a trading brig out of the port of Aberdeen, walking on an artificial limb."

The ends of the bones, in this very interesting case, exhibited all the distinctive characters of destruction by diffuse strumous infiltration; and the conclusion arrived at by the operator is so just, that, should no companion case be brought forward, it may serve as a beacon to warn those less experienced from attempting a similar proceeding. "Reason told me so (I was wrong) before I operated; but I tried it. I thought an open joint, with the free discharge and irritation lessened—that good keep, and other suitable treatment, might remedy even the disease of the bones; but no, no."

From the details of this single case it would appear that the operation of resection is not adapted for the treatment of knee-joints destroyed by diffuse strumous infiltration of the articular extremities of the tibia and femur; and such a conclusion is, I believe, fully justified.

The two great objects to be obtained by resection of a diseased articulation are—removal of every trace of disease, and giving to the patient a good and useful limb. To insure the former requisite it is absolutely necessary that such cases only should be submitted to the operation in which the nature and extent of the disease is clearly and distinctly ascertained not to involve a greater amount of structure than can be removed with propriety. Unfortunately, the diffuse form of strumous infiltration, in the majority of instances in which it destroys the integrity of the knee articulation, is too extensive to be entirely removed, and therefore the operation is decidedly inappropriate for this class of disease.

That the patient may possess a useful limb, in every way superior to a wooden substitute, it is imperative that the cut surfaces of the bone should be firmly bound together by union of such strength as will enable all the motions of progression to be performed with comfort and facility. It is by no means absolutely necessary that the bond of union should be completely osseous in character, although I am aware that many, not particularly well informed on this interesting subject, deem such a termination indispensable.

I am acquainted with instances where an admirable degree of usefulness is afforded by limbs in which union of the surfaces of bone is,

if not altogether, in a great measure fibrous and flexible: and it is not improbable that ere long it may be deemed desirable to retain a certain degree of motion, instead of obtaining a firm osseous anchylosis. But it is questionable if reparation even of the latter kind will take place between the exposed surfaces of the two bones. It is tolerably certain that no new bone will be formed, as the mother structures are incapable of accomplishing such repair, and the only junction that could with any reasonable hope be expected, would arise from parts external to the osseous walls. If such cases be subjected to the operation of resection, it will probably be through ignorance of the true state of the affection. Various terminations may follow the unwise adoption. It may happen, that for some considerable time everything may seem to progress favourably. The soft parts may heal to a great extent, but no union may be discernible as arising between the cut surfaces of bone, although experience points to the contrary hope, and a natural dread of amputation may for a longer period encourage the patient and surgeon. Or a more serious termination may quickly follow the operation. The diminished vitality of the divided structures, the debilitated constitution of the patient, and the inappropriate manner in which the subsequent treatment may be carried out, may favour the lighting up of unhealthy inflammation, which is not improbable to end in destruction of the exposed bone by caries or necrosis. A timely resort to the knife and gouge may for a period avert further mischief. This has happened once in my own practice, and the removal of the dead portions of bone was attended with a beneficial result. Ultimately, however, the withering powers of the patient, distressed by the constant irritation of an unclosed wound combined with unhealthy and extensive suppuration, may call for amputation, as in the case recorded by Dr. Keith, and, if the truth were known, as has more frequently happened in the practice of other surgeons.

No generous diet or the exhibition of bone-making material, as phosphate of lime, is sufficient to cure this diffuse form of disease, even when the greater part may have been removed in the operation by resection; and, unless future experience shall dictate to the contrary, I must, although an ardent supporter of this great and useful operation, unwillingly give preference to removal of the disease by amputation of the thigh.—*Med. Times and Gazette, Aug.* 1, 1857, *p.* 111.

52.—ON THE SUCCESSFUL TREATMENT OF HYDRARTHROSIS OF THE KNEE-JOINT, BY PUNCTURE AND INJECTION OF IODINE.

By Dr. Robert Macdonnell, Surgeon to St. Patrick's Hospital, Montreal.

[The practice of treating hydrarthroses by puncture has been condemned by recent British writers on surgery. The author was induced to attempt this method from the successful results obtained by it in the treatment of hydroceles and synovial bursæ. He says:—]

I have now treated successfully five cases of hydrarthrosis of the knee-joint by this method, and as three of them have been witnessed by my brother practitioners in this city, I prefer giving them in illustration, to detailing my two other cases which occurred in private practice, and of whom I have had no information since they left Montreal. It is enough to mention, that they did not leave till they were quite satisfied that a cure had been effected. In almost all particulars their symptoms both before and after the operation, resembled those of the patients whose cases I am about to detail :—

Case.—A. P., a cooper by trade, aged 26, consulted me, April 11th, 1853, on account of an affection of the right knee-joint of four years' duration. He was a thin middle-sized man, without any marks of scrofula about him, of dark complexion and bilious temperament. He stated that the present disease began four years before, with pain in the right knee, which gradually increased, and was soon followed by perceptible swelling of the joint, and these symptoms becoming daily more distressing, he consulted several surgeons of this city, and adopted various remedies recommended by his friends, without benefit. For a year before I saw him, he was unable to work at his trade and could not walk, except with the aid of a crutch and cane. It is unnecessary to detail the various plans of treatment that had been pursued, suffice it to say, that the joint bore evidence of all the usual remedies for chronic synovitis having been employed. On examination, I found the joint much enlarged, being four inches greater in circumference than the opposite one : but this enlargement was not so perceptible in the joint itself, as in the circumference of the thigh immediately above the patella, where there was a large oval-shaped swelling extending along the outer side of the tendon of the rectus femoris, to a distance of nearly five inches, and communicating under that tendon with another swelling, of a similar shape but much smaller, on the inner side of the the thigh. At each side of the ligamentum patellæ there were small tumours which fluctuated and communicated with those above, giving to the joint the *bosselé* appearance so well described by Bonnet. The integument was not discoloured except from the effects of previous treatment ; there were no enlarged or tortuous veins on the surface of the tumours ; pain at the lower edge of patella and inner side of the knee increasing at night, or after attempts at walking, was complained of. When at rest, the leg was usually flexed, and then the joint presented a more globular form than when the leg was fully extended; the patella appeared on the summit of the swelling, but when extension was made, the tendon of the rectus, the patella, and ligamentum patellæ appeared depressed, and the tumours already described, became better developed. There was no emaciation of the leg or thigh.

Being satisfied that the ordinary plan of treatment would not succeed, I determined to puncture the joint and let out its contents, as from the great size of the swelling, I was anxious to reserve the injection of the sac until it had become somewhat diminished, in the event

of its filling again after puncture. Assisted by Dr. Jones, Surgeon to the Montreal General Hospital, I tapped the outer and larger tumour with a small hydrocele trocar, taking care to make the puncture at the part most remote from the joint, and drew off a large bowlful of fluid, of a straw colour and closely resembling the contents of a hydrocele. The reader may conceive the quantity of fluid contained in the sac, when he is informed that I brought away, for chemical and microscopic examination, the full of a Florence oil-flask, besides what was spilt and left at the patient's residence. The operation produced no inconvenience, adhesive plaster was put over the aperture, and the joint bound up in a wet bandage; another wet bandage was carried from the ankle to a distance above the knee, a padded splint was placed under the knee, and so fixed above and below, as to prevent the least motion in the joint. Small doses of tartar emetic were administered, low diet prescribed, and directions given that the bandages should be kept moist with luke-warm water.

It is unnecessary to detail the daily symptoms. For the first twenty-four hours there was no pain complained of, and the patient appeared very comfortable, but on the second day, the joint began to swell, and I was obliged to loosen the bandage slightly. The swelling increased gradually but without any increase of suffering for the next ten days. I now determined to avail myself of the reduced size of the hydrops, to puncture it again, and inject the sac with iodine, which I did on the 12th day from the first operation. This was done in the following manner:—The leg being extended, a wet bandage was placed round the lower part of the knee-joint, and carried up to a level with the upper edge of the patella. It was given in charge to an assistant with directions to draw tightly upon it, whilst the fluid flowed through the canula. By this means the contents of the lower part of the synovial sac were pushed up into the pouch above the level of the articulation, making the upper tumour more full and tense, and serving to protect the articulating surfaces from the first effects of the injection. When the fluid was drawn off, about *two drachms of the strongest tincture of iodine with an equal quantity of luke-warm water* were injected through the canula, and allowed to remain; care being taken, by changing the position of the joint, and manipulating the sac, that it should come in contact with the whole inner surface of the synovial membrane lying in front of the femur.

The wet bandage was now carried round the limb, to a distance of six inches above the patella, and moderate and equable pressure was thereby exercised upon the point. A long padded splint was applied, and perfect rest of the joint thus secured. The patient complained next day of severe pain, but not so great as to oblige me to remove the bandages. An opiate was given for the first three nights, and after that, the patient felt so well, that he left his bed on the fourth day, and I ceased to attend him at the end of three weeks. I have not seen him since, though I hear frequently of him. He soon

returned to his trade, and has worked at it for the last four years without any return of the disease. For some time after the operation, the affected limb remained weak, and yielded in walking, but his friends assure me he is now quite well, and walks without the least lameness. At his recommendation the patient whose case immediately follows, was sent to me by a society that had supported him for the last two years.

Case 2. A. C., aged 40, cooper, a dark complexioned man of slender make and unhealthy appearance, consulted me under the following circumstances:—For the last *four* years he had suffered from an affection of the left knee-joint, which had rendered him unable to earn his livelihood for two years past, since which period, he has been supported by a charitable institution in this city. He states that he has been treated by *thirteen* medical men, and his knee-joint bears marks of frequent cupping, moxas, issues, and pustulating liniments and ointments. He has been blistered several times, and has taken a great deal of medicine internally. The usual quack nostrums resorted to by persons of his rank, when they have in vain sought relief from scientific surgery, have also been tried in succession, and so convinced was he that it was useless to attempt anything further, that he had abandoned all hope of recovery, when he heard of the patient whose case has been described. It is unnecessary to detail at great length the symptoms he complained of, but in a few particulars his case differed from the former one. *The leg and thigh were much emaciated*, the swelling was greatest on the *inner* side of the knee-joint and the corresponding side of the patella, and though the joint appeared much larger than the other, it was only two inches greater in circumference. The patella was pushed forward very much, and on examining the inner side of the joint, the crackling sensations spoken of by authors were easily detected. The leg was flexed, and extension caused pain. During the day he suffered less than at night. I advised him to enter St. Patrick's Hospital, where I operated on him, on the 13th April, 1857, being assisted by my colleagues Drs. David and Howard.

The puncture and injection were performed precisely as in the former case, and the same precautions taken to have the joint firmly bandaged from below. I need not fatigue the reader with the daily details of the case; for, truth to say, nothing worthy of note occurred. There was no swelling or pain in the joint, no fever, no uneasiness whatever; and though my directions were very explicit that he should not attempt to move the joint, yet I had great difficulty in persuading him to remain quiet in bed. The wet bandage was continued for ten days; then a dry one was kept applied for a few days; and, finally, the knee-joint was put up in a starched bandage, and gentle use of the limb permitted. From the beginning till the end of the treatment, there was not a single symptom present to cause one moment's anxiety.

Case 3. This case, also witnessed by my colleagues, Drs. David and

Howard, is still more encouraging; for, though the operation was performed under very unfavourable circumstances, yet the perfect success of the treatment must do much to remove the prejudice that exists against it.

A dark complexioned middle-sized man, aged 25, a carriage-maker, who had come from the United States to consult me, presented the following appearance:—The right eye was prominent, owing to caries of the malar bone which had left a deep depression, corresponding to its orbital portion; the nose was depressed slightly in the centre, from the destruction of both lachrymal bones, with corresponding parts of the nasal and superior maxillary bones. The surface of the body was marked with scars, the results of former ulcerations; and from the carious bones of the nose fœtid discharge was taking place, and the two holes above the diseased lachrymal bones were filled up with pledgets of charpie; a most offensive fœtor was exhaled from his nose and mouth. In addition to the above diseases, he presented a well marked hydrarthrosis of the left knee, of *seven* years' duration, which had been so distressing for the last two years that he had been almost unable to put the foot to the ground. For the first year, he says, he was able to keep down the disease by rest, counter-irritation, and internal remedies. For the next three years, he was able to walk about with the aid of a staff, and to work at some parts of his trade which did not oblige him to stand. He also sought other employments requiring less use of the limb. For the last two years he has been under medical treatment in different hospitals in the United States; and though the disease of the facial bones is distressing, yet, as the affection of the knee prevents him earning a livelihood, he is more anxious about it than his other maladies.

The left knee was enlarged to the extent of two inches and a half, both below and above the patella, and the enlargement was more of an oval shape than globular, and was not greater on one side of the rectus femoris than the other, but seemed to lie mostly under its tendon, pushing it forward and giving to the upper part of the swelling an abrupt commencement. When pressure was made upon one side of the rectus tendon, the fluid was pushed to the opposite side, making a prominent tumour. The fluid could be easily made to pass from one portion of the joint to the other. The integument appeared thicker and paler than in the two former cases, and was not so much discoloured from local treatment. As the patient had himself witnessed the result of the treatment in the second case, he gladly consented to my proposal to adopt the same plan with him.

The puncture and injection were performed as already described, on April 28th, 1857. The quantity of fluid drawn off did not amount to more than six or seven ounces. It was clear and yellow, presenting the usual characters of the contents of these dropsies. The integument was not thinned so much as in the four other cases. No pain or swelling followed the operation, and notwithstanding his cachectic

appearance and bad constitution, the progress towards cure was uninterrupted by the occurrence of a single bad symptom.

Many of those who object to the above plan of treatment, do so under an erroneous idea of the nature of the disease for which it is recommended, and also of the results that are expected to be derived from it. Thus, we find some who have written and spoken against it, confounding simple chronic hydrarthrosis with white swelling (tumeur blanche), and objecting to the injection of a dropsical joint, because the treatment did not succeed in a completely disorganized and suppurating articulation. Now, I would wish it to be distinctly understood, that it is to *pure uncomplicated chronic hydrops* of the knee-joint that my suggestions as yet apply; for I have not employed the treatment in any other joint, and though I do not believe that injection of iodine would do any harm to a joint already destroyed by ulceration, yet I wish the point to be clearly understood, that it is not in such affections I recommend it. It has also been stated that serious consequences must necessarily follow the mere puncture of so large a joint, and *a fortiori*, the injection of it with iodine, or any other irritating substance, must be extremely dangerous. I shall not here occupy my reader's time in proving the difference, as to consequences, between the puncture of a joint in its *physiological* condition and a similar wound inflicted upon it in its *pathological* state. Until the surgeon shall have acquired clear and distinct ideas on this point of practice, he cannot understand the rationale of injections into joints, the seats of chronic synovial effusions; nor of incisions into large and small joints already in a state of suppuration, as recommended by Gay and others, and which (as regards the smaller joints) I have myself often performed.

There is another objection urged against this practice, founded on the supposition that excessive inflammatory action must necessarily follow the injection, and that anchylosis or even the death of the patient might ensue. In this, as in other instances, one fact is worth a hundred theories. Puncture and injection have been performed not only without bad consequences, but with the greatest success; therefore, to discuss this point any further would be fruitless. But some of the opposition to the practice may be ascribed to the views of Bonnet himself, and to his method of operating. He injected the joint, with the express object of exciting an acute arthritis, which being combated in the usual manner, led to the removal of diseased action from the articulation, and no steps were taken to prevent this excessive inflammatory process. Now, it is evident, that, as in hydrocele, the radical cure is often effected, not by inducing violent inflammation of the sac, but by modifying its diseased secreting action, so we should endeavour to induce merely a slight change of action in the synovial lining of the joint; and adhere, as closely as possible, to the rule laid down by Velpeau and Cabaret to procure in shut cavities, containing effused fluid, an irritation which should be constantly adhesive and never purulent.

By the method which I recommend, the fluid is forced upwards from the articulation to the synovial bag above the joint lying on the anterior surface of the femur, and when the fluid is withdrawn and only half an ounce of iodine solution injected, the opposed surfaces of the sac are brought into contact and retained in that position by the gentle and equable pressure of a well applied wet bandage. By this means air is prevented entering the joint, the injected fluid is spread out evenly over the whole synovial surface, and becomes still more diluted by admixture with the secretions of the parts, and a healthy action taking place, excess of exudation and engorgement are prevented, and it is not unlikely that adhesion occurs in the opposed surfaces of the dilated pouch in front of the femur. This result is still further favoured by retaining the joint in an immovable position by bandaging it to a straight splint, and by keeping the patient upon cooling diet. Bonnet recommends us to push the trocar down in a perpendicular direction from the front of the tumour till it strikes the femur. I see no advantage in piercing the synovial membrane in two places, and in wounding the femur; nor have I followed his other direction to inject a quantity of iodine solution, equal to the amount of fluid drawn off. In my practice I have thrown in only two drachms of strong tincture mixed with two of luke-warm water.

In conclusion, I would wish it to be understood, that I do not advise the above line of treatment to be pursued, except in simple uncomplicated hydrarthrosis, that has resisted all other remedies, and that has led to loss of use of the limb, or has prevented the patient earning a livelihood, and enfeebled his constitution by protracted suffering.—*Montreal Medical Chronicle, June*, 1857, *p.* 6.

53.—IMPROVED METHOD OF AMPUTATION AT THE ANKLE-JOINT.

By Richard Quain, Esq., F.R.S. (Reported by Vincent Jackson, House-Surgeon to University College Hospital.)

[Mr. Quain has lately made a change in his mode of performing this operation; in a clinical lecture lately, he said,]

"It appears to me, and indeed it has always appeared to me, that the chief advantage of the operation for removing the foot at the ankle-joint, is due to the fact, that the patient is enabled in progression afterwards to bear directly upon the stump. After any other amputation higher up—that for instance above the ankle, which in other respects is equally if not more advantageous, the person cannot bear his weight upon the end of the stump. Ulceration of the integument would follow; while after an amputation at the ankle-joint, with a flap taken from beneath the heel—from structures, that is to say, which are organized for the purpose—with that covering the bones, pressure is sustained by the end of the stump without injury.

"Now as to the plan of performing the operation:—When it was first suggested that the flap should be taken from the under surface of the foot instead of being made from the front and sides of the joint as previously practised, Mr. Syme, the author of the suggestion, advised that an incision should be made from one malleolus to the other beneath the os calcis. But the dissecting back the concave flap thus marked out from the projection of the heel is a tedious process. One has to dissect in a confined space over the irregularities of the bone; and it has often happened that the integuments have been perforated behind the heel. Moreover if you read the histories of cases fairly reported, in which the operation has been performed in that way, you will find that counter openings were subsequently required to evacuate pus collected in the cup-like flap. It is in consequence of these evils that I was led to operate in a different manner in some cases lately. Thus, after the incision from malleolus to malleolus under the os calcis, I make a straight incision at right angles with the first, to the back part of the heel on the outer side of the foot, a little above and parallel with its outer margin—between therefore the point of the outer malleolus and the margin of the foot. This plan facilitates the dissection from the os calcis, and hastens the operation. Independently of the direct advantage of this method of operating, I may remind you by way of answer to possible objections, that the blood vessels (anterior tibial and posterior tibial) as well as the thicker soft structures, lie at the forepart and inner side of the ankle-joint and beneath the foot. It is upon the careful preservation of these parts that the nutrition and the firmness of the stump depend. At the outer side, on the contrary, the os calcis is covered only with integument, while the slender blood vessel, the end of the peroneal artery, as it runs along the periosteum, is injured, probably made useless during the dissection. Hence the incision through this part, while it sets free the flap all around and hinders the bagging of purulent matter, does not interfere with any important structure.

"It may be mentioned, too, that in the recorded cases of the amputation as usually performed, the outer part of the flap, the part now in question, had often been mentioned as having sloughed. This fact is accounted for by the conformation just referred to."

As no mention is made in the foregoing observations of other parts of the operation, it perhaps should be stated that Mr. Quain makes the plantar part of the principal flap short, though long enough to cover fully the end of the tibia; and that he forms an anterior flap, which in the cases above related met the larger one easily. He dwells on the advantage of so cutting the edges of the two flaps, by bevelling the parts beneath the integument, that they shall in the dressing meet skin to skin as far as possible. This is done with a view to avoid the need for the formation of much new skin during the cicatrization.

I may likewise mention, that with the same view of facilitating the process, I have seen the operation performed with an incision directed

obliquely backwards from the malleoli to the point of the heel. This plan, of course, removes the difficulty by omitting the only difficult part of the operation; but the structures from the sole of the foot, those "organized for the purpose" of bearing the weight of the body in progression, are excluded from the flap.—*Med. Times and Gazette, Oct.* 10, 1857, *p.* 369.

54.—ON EXCISION OF THE ELBOW-JOINT.

By E. R. Bickersteth, Esq., Surgeon to the Liverpool Royal Infirmary.

[The success attending operations on the elbow-joint of this nature is very great, providing the cases are well selected, and the after treatment properly managed. Mr. Bickersteth has frequently examined the bones in cases in which amputation has been performed for caries of the bones of the elbow-joint, and has not met with a single instance in which the entire disease might not have been removed by excision of the articular extremities of the bones.]

Excision of the elbow-joint can scarcely be considered a dangerous operation, unless undertaken in the unhealthy wards of a hospital. Out of nineteen cases in my own practice, only two died from the effects of the operation: one a woman, who was seized with delirium tremens in its most severe form, on the twenty-sixth day after the operation, and who died exhausted in thirty-six hours, during which time every means failed to procure sleep, or even a moment's rest, from the most violent excitement; the other, an emaciated and feeble woman, sixty-four years of age, sank exhausted between the second and third week following the operation.

In performing the operation, two objects should be constantly borne in mind: first, to remove all the diseased bone; and second, to do this in such a way that a useful and movable joint may result. To obtain these two objects, whatever the variety of extent or situation of the disease, one uniform plan of proceeding should be adopted. I have already mentioned how rarely the disease extends beyond the actual articular extremities. Not unfrequently, however, the caries is confined to the extremity of one bone, or even to a limited portion of one articular surface; and in these cases, attempts have been often made to obtain a cure by the removal of the diseased portion only, under the supposition that this partial operation is less severe, and that excision of all the bones is not therefore justifiable. The results of cases of partial excision prove, however, that frequently the disease afterwards extends to the other bones, and complete excision or amputation is eventually required; and that, even should the partial operation be ultimately successful, it gives rise to equal or more severe suffering and fever, than complete excision; while the usefulness of the arm, from the degree of anchylosis that always occurs, is not to be compared

with a successful case of complete excision. I believe, therefore, that if it is necessary to remove any part of the articular surface, it is far better, and at the same time not more dangerous to life, to take away the whole.

Much doubt has been expressed with regard to the exact amount of bone it is desirable to remove, in order to afford the prospect of a useful and movable joint; and perhaps no point in the operation requires nicer judgment or more experience for its determination. If too much be removed, the arm will be left dangling and useless: if too little, the joint will be stiff and more or less anchylosed. The exact amount can only be determined by the peculiarities of each particular case; and often after the excision has been completed, and all the disease has been removed, the experienced operator will find it better to take off another slice from one of the bones, in the expectation that thereby a more useful articulation will be formed. As a general rule, however, it may be said (presuming of course that all the disease is removed) that the section of the humerus should be made through the broad expanded portion just above the condyles, and that the ulna should be cut through immediately below the lesser sigmoid cavity; the head of the radius can afterwards be snipped off with the bone pliers, on a level with the section of the ulna.

Several different plans have been proposed for performing excision of the elbow. Some have recommended that the joint should be exposed by a semicircular flap raised from its posterior part; others have advocated that the incision should be made in the form of the letter T; and others again, that the part is more fully and easily exposed by adopting the H form of incision. The latter, I believe, is the best, and is that which is always practised by Mr. Syme, who has probably performed this operation more frequently than any other surgeon. In the following description of the steps to be adopted, I do not claim any novelty, but merely desire to mention the plan, which in my own practice I have found at once simple and easy of execution. An assistant holds the arm firmly and steadily, while the operator discovers, with the thumb nail of the left hand, the exact position of the ulnar nerve as it passes over the internal condyle. Protecting the nerve in this way, he then plunges a strong bistoury, its back being placed against the nail of his thumb, directly into the joint, and carries it across the olecranon to the opposite side of the arm. Having thus made the transverse incision, he completes the form of the letter H by making lateral incisions of sufficient length. The flaps are then reflected; and the olecranon, being exposed, is cut off with strong bone pliers. The joint is now fairly opened, and the next object is to detach the ulnar nerve from the dangerous position it occupies behind the internal condyle. The external lateral ligament must first be divided, and then the assistant who holds the arm and stands on the opposite side of the patient, must be directed to push the radius and ulna away from him, while he keeps the humerus perfectly stationary.

A partial lateral dislocation of the joint is thus produced, and the ulnar nerve, being carried along with the displaced forearm, is lifted out from its bed, and requires only a little careful separation from its cellular attachments before it can be passed over the condyle and placed beyond reach of danger. The end of the humerus is then sawn off, and afterwards the extremities of the ulna and radius, either separately or together. Two or three vessels usually require ligature, and particularly the posterior ulnar recurrent, which often bleeds freely. Before closing the wound, it is well to place the arm in position, so that an opinion may be formed whether sufficient bone has been removed. If the transverse incision does not come together easily, without actual contact of the opposing sawn surfaces, it will be better to remove half an inch more bone from one extremity, as by so doing there is much less fear of the new joint becoming anchylosed. When the flaps are brought together, the arm should admit of being bent at right angles without any locking of the bones, or any tension on the transverse incision. Several sutures should be introduced more especially into the transverse incision, the edges of which must be brought into accurate contact, as upon their union by the first intention much of the future success depends. Large pads of lint are then so applied as to protect the wound and at the same time not prevent the free discharge of matter. The arm is placed in a position midway between extension and semiflexion, and a bandage five or six yards in length wrapped round and round the joint, in the form of the figure 8. The patient should be placed in bed with the head low, and the arm carefully and evenly supported upon a pillow, so arranged that the hand rests over the lower part of the abdomen.

It is of great importance that perfect quietness be observed for the first few days after the operation. The least movement of the body disturbs the elbow, and not only gives pain, but retards the healing process. At the end of forty-eight hours the bandage may be cut off, the pads of lint removed, and the sutures in the transverse incision taken out. At the same time, two or three long narrow strips of plaister should be placed lengthways along the back of the arm and forearm, so as to give support to the union of the transverse incision. If the sutures in the longitudinal incisions have given rise to any sloughing or inflammation, they also had better be removed at the same time; but if this has not occurred, it is well to leave them for a day or two longer. It is advisable to finish as much of the dressing as is practicable before raising the arm, and when it becomes necessary to lift it, the greatest care must be taken to prevent any displacement of the incisions. After the sutures in the longitudinal incisions have been removed, two other strips of plaister should be arranged at right angles to those already placed at the back of the arm. They should nearly, but not quite, encircle the limb; one being above, the other below the bend of the arm. They should not be placed too near the transverse incision, nor obliquely across it, as in either case they

would tend to press the flaps inwards upon the ends of the bones. If they are arranged parallel to the transverse incision, one about an inch and a quarter above it, and the other the same distance below it, they will have the effect of keeping the edges of the incision in contact, without exercising too much pressure on the interval between the bones. The water dressing and figure of 8 bandage must then be applied, and the same dressing repeated daily till the incisions have firmly united. When this has taken place, which will usually be from a week to ten days after the operation, the joint, hitherto kept perfectly quiet, should be moved passively every day. The patient should get up, and have the arm placed in a sling, with directions to take it out occasionally and move it as freely as can be borne without giving pain. At this stage of the curative process, there is a great tendency in the new joint to become stiff, and the more this tendency can be overcome by early, free, and frequent passive movement of the part, the more useful and perfect the arm will be. But care must be taken lest the exercise is carried to excess, or the joint will become inflamed, and perfect rest rendered necessary.

It will thus be observed that the after treatment varies in the different stages of recovery. For the first week, or until the transverse incision has firmly united, our efforts are mainly directed to prevent any movement of the part. Afterwards, we encourage as far as possible free movement, knowing that if not quickly accomplished, the difficulty of obtaining it daily increases.

I have been minute in describing the means of obtaining the speedy union of the incisions, because I believe that the future usefulness of the arm depends very much upon this point. If the transverse incision does not unite by the first intention, or if the plaisters are improperly arranged so as to press on the space between the bones, the flaps are almost sure to sink in, the upper one to unite upon the end of the humerus, and the lower one upon the extremity of the ulna. And if this untoward event occurs, it is hardly possible that any save the most imperfect joint can be formed, the probability being rather, that the arm would be altogether useless. In the hope of securing more complete rest of the part during this period, many have recommended, and made use of, splints of various sorts; but I am satisfied, after repeated trials, that apparatus of this kind is best dispensed with, and that nothing answers so effectively for restraining all movements as the well applied figure of 8 bandage.

Hitherto I have spoken of excision for the treatment of incurable disease, but there is another class of cases in which the operation has been performed with equal propriety and with most signal success—cases of anchylosis of the arm in the straight position. When excision of the elbow was first proposed, it was the constant endeavour of the surgeon to obtain firm anchylosis of the bones in the most favourable position. In spite of all his care, however, a false joint sometimes formed, and then it was observed that the arm was more useful in this

state than when anchylosed. In the present day we cut out the anchylosed joint, in the hope of obtaining in its stead a useful and movable articulation. Partial or complete anchylosis in the extended position, is not an uncommon result from the spontaneous cure of scrofulous disease of the elbow during childhood. The same deformity, also, frequently occurs, from the improper treatment of oblique fracture of the lower end of the humerus into the elbow-joint. But from whatever cause it arises, the distress and inconvenience occasioned by straight anchylosis of the elbow is so great, that the patient is usually glad to submit to any means affording a prospect of remedy. I have met with two cases in which both arms were fixed in the straight position, and nothing could exceed the helpless condition of these unfortunate subjects. Unable even to feed themselves, they were entirely dependent on the assistance of others. In each case the right elbow was excised, and the joint rendered useful and movable.

In operating for anchylosis, the same general directions must be followed as are already described. The surgeon should, however, be prepared to encounter much greater difficulties than in the operation for disease of the joint. All the relationships of the part are destroyed, and the bones, if not truly anchylosed, are so firmly united that considerable force is required to break down the adhesions. It is in these cases more particularly, that it is desirable to remove the bones so freely, that a considerable interval is left between the divided extremities: for if this is not done, the natural tendency of the bones to reunite is so strong, that no efforts on the part of the surgeon, or of the patient, will prevent the joint from again becoming stiff. In an article recently published by Mr. Butcher, of Dublin, 'On the Excision of Joints,' he proposes what he calls "a new operation, in cases where the joint has been firmly anchylosed in the straight position of the injury." His plan consists in making a transverse incision across the back of the elbow, introducing his resection-saw in front of the joint, between the artery and the bone, and cutting through "all resisting parts from before, backwards;" but without the removal of any bone whatever. Fortunately Mr. Butcher does not appear to have practised this operation on the living subject. Had he done so, no one who has had any experience in the treatment of these cases, can doubt that his patients would be placed in a far more distressing condition than before the operation.

The wonderful degree of perfection attained by the new joint, after complete resection, has long been a matter of surprise, even to the most enthusiastic supporters of the operation. That a highly complex organization, such as a large joint, should not only be re-formed, but be capable of exercising its functions in a manner, scarcely, if at all, inferior to the natural formation, was more than could be understood. While the surgeon regarded the admirable adaptation of nature's process, and reflected with pleasure on the share that his own handiwork had in directing and determining the "vis medicatrix

naturæ," he could not explain by what means the result was accomplished—he could only surmise that a species of false joint had occurred. That a structure had formed, so perfect that, except in external shape, it scarcely differed from the natural joint, was not supposed possible; yet such is actually true, as proved by post-mortem examination.—*Liverpool Medico-Chirurgical Journal, July* 1857, *p.* 201.

55.—ON THE OSTEOTRITE, FOR THE REMOVAL OF CARIOUS BONE.

Of all the various instruments in daily use for the removal of diseased bone, in a carious or necrosed condition, which we have, we may truly say, hundreds of times seen used, none have appeared so ingenious and useful as the osteotrite, recently invented and employed by Mr. Marshall. It consists of a handle similar to that of the common gouge, into which is fixed a steel shaft, terminating in a round, somewhat conical head, which varies in size, but which possesses a series of spiral cutting edges, radiating from two points on the sides of the vertex. Between these two apices are two or three other spirals, which are continued across the head. The grooves between the spiral edges are deep, and about an eighth of an inch apart, the teeth thus formed being turned to the right, and are pretty sharp. The drawing gives a good idea of the instrument, which is about the length of an ordinary gouge, but constructed on the principle of the "millhead" instrument in common use amongst dentists. It might be looked upon as one, on a large scale. There are three sizes of the instrument, made by Coxeter, of Grafton-street, one larger and one smaller than the drawing, which represents the medium size. When the osteotrite is used, as, for instance, on a soft surface of bone, and rotated by a movement of the wrist, it cuts like a saw or rasp, and removes with perfect ease the diseased structure, the sensation communicated to the hand indicating when it is in contact with healthy bone. It can be, moreover, introduced into a cavity without much dilatation of the external wound, and the diseased structure lining its interior removed with facility. As contrasted with some of the ordinary instruments in use, it does not leave any loose splinters behind from the nature of its action; and as it is very strongly made, there is no risk of accidents from breakage or from slipping.

We have seen it used by Mr. Erichsen to remove some diseased bone from the femur of a boy, on whom he had performed excision of the hip-joint some months before. Mr. Marshall employed it with good effects in a case of necrosis of the ribs, and in one of caries of the os calcis in a girl. It is not an uncommon thing to find pretty large cavities in this last-mentioned bone, which we have seen sometimes

give the surgeon great trouble to clean out; with the osteotrite, however, all the soft and carious bone is got rid of most effectually. In Mr. Marshall's case, the cavity in the os calcis was cleared of disease through a small external wound; and, upon the rib, the healthy bone was known at once when the diseased part was removed. The same principle guides the dentist in his operations on the teeth. We have heard the inventor say that he can remove the diseased bone from a very large surface by its means.—*Lancet, June* 20, 1857, *p.* 628.

56.—ON A NEW METHOD OF CONSTRUCTING ARTIFICIAL LEGS.

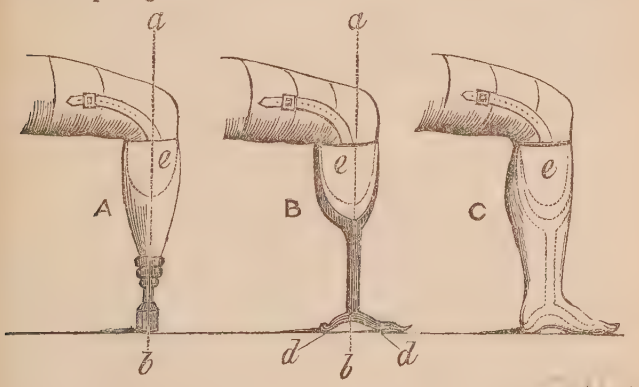
By Kenneth H. Cornish, Esq.

[The following useful remarks on the construction of artificial legs, apply to amputations of the leg, properly so-called—that is, to amputation below the knee-joint.]

In the first place, it will be necessary to avoid one error which has studiously been committed from the earliest times—an error which the inventor of the common "peg-leg" fell into, and which none of his successors have had the sagacity to perceive and obviate. The strangest circumstance connected with this blunder is, that a very superficial study of the mechanical philosophy displayed in the osteology of the lower limb ought to have at once exposed it. I will endeavour to clear the matter up. The line of weight or "force" in the natural limb passes mainly through the tibia on to the foot, upon the arch of which the whole body rests: very little of the weight passes through the fibula—next to none (if any) through the soft parts. Now, the tibia is placed to the front of the leg, rather than the centre, yet we find that in the common wooden leg the peg is placed quite in the centre. A reference to fig. A, as compared with fig. B, will explain my meaning far better than I could convey it verbally. In cork and other fancy-legs, as much of the weight rests on the back part, correspondent to the soft parts, as upon the front, which represents the osseous system,—plainly thereby directly contradicting the law of construction followed by Nature. The convergence of the lines of force at the ankle-joint is thus completely prevented, and instead of falling upon the key-stone of the arch of the foot, prior to their divergence to the piers, they fall upon piers and key-stone equally and cotemporaneously, destroying all chance of elasticity in the arch. *It is impossible by such a construction to obtain a "centre of motion."* Now, I propose throwing my main support more forwards, so that the position of the pin, in relation to the rest of the apparatus, may coincide with that of the tibia in the normal limb. (*Vide* woodcut B.) Instead of letting the weight pass directly to the ground, I would endeavour to procure a new centre of motion, coincident of course with the line of weight, at a point answerable to the ankle-joint of the sound limb,

and I would then construct an arched foot, on which the weight of the body should rest, just below this point. The principles on which I should proceed to do this would be analogous to those which I proposed for the construction of my artificial foot for Chopart's operation, with this difference, that here the whole arch of the foot, piers and centre, must be constructed. Luckily, this lessens the difficulty, instead of increasing it, as might at first sight have been expected. It will only be necessary to have a strong metal centre applied to the end of the pin, from which, as from a key-stone, the piers of the arch will diverge,—the posterior pier being formed by two very powerful springs, passing backwards to the ground; the anterior by five, arranged as much as possible after the fashion of the metatarsal bones, so as to obtain the lateral as well as the antero-posterior arch. At the part which corresponds with the phalanges, the springs must form a series of wave-like curves, as in the artificial foot already alluded to. I omitted to state, that the sheath of the leg would greatly resemble that of the ordinary socket-and-peg apparatus, the bearing of course being taken from the tuberosities of the tibia, and the end of the stump kept intact from friction or weight.

Thus much for the necessary part of the leg; now for the ornamental. All that is necessary is, that the shape of a perfect limb be imitated in pliable leather, stuffed with cotton wool, these representing the soft parts and integuments. (*Vide* drawing C.) The expense of a leg such as I have described would not greatly exceed that of the socket-and-pin leg.



A, Old socket-and-pin leg.
B, My leg in the skeleton only.
C, Ditto, as finished, the outline of the weight-bearing part being dotted.
a, b, Main lines of weight, given correctly in B.
d, d, Radii of force proceeding from "centre of motion."
e, Outline of stump.

Any person already in possession of the apparatus just mentioned might easily have my alterations added to it. Mr. Bigg, of Leicester-square, will carry out the practical details of this invention, as well as of my artificial foot. I think that the pin might with advantage be formed of "Goodyear's vulcanized indiarubber;" it is strong, light, and elastic.—*Lancet, Oct.* 10, 1857, *p.* 360.

57.—*Paper Splints.* By JOHN C. SAVERY, House Surgeon to the Northampton General Infirmary.—I have for the last fifteen months been in the habit of putting our fractured legs up in pasted paper, when the swelling has subsided, which enables our patients to leave their beds at the end of ten days or a fortnight. I do not claim any originality for the idea, which I saw practised in Paris, but as I have not yet observed any notice of it in England, and have found it so very useful, I should be glad if it was more extensively known. The advantages it possesses over the starched bandage, of which it is a modification, are, that sloughing from over-pressure is impossible, as on attempting to pull the paper too tight it tears, and the materials for it are always at hand. My mode of procedure is as follows:—I prepare forty or fifty strips of brown paper, 1¼ inch wide and 16 long; these are all smeared with thick paste, and applied to the limb in the ordinary manner of strapping: three layers are applied, a light bandage over all, and then left to dry, supported by sand-bags; the strips are all pasted before any are put on; in twenty-four hours it forms a very hard, light case, exactly applied to the limb, which affords perfect protection during the reparative process. It must be well soaked before removal.—*Med. Times and Gazette, July* 11, 1857, *p.* 45.

58.—ON THE MECHANICAL TREATMENT OF TALIPES VARUS.

By WM. ADAMS, Esq., Assistant Surgeon to the Royal Orthopædic Hospital.

The mechanical treatment has reference—1. To the reparative process in the divided tendons; and 2. To the restoration of the form of the foot. With respect to the first point, I would only observe that very erroneous ideas appear to exist. It is generally said that the divided tendons must be allowed to reunite, and then the new connecting material gradually stretched by mechanical means to the requisite length. I believe the theory of stretching the new material formed in the reparation of tendon to be altogether erroneous. The new material does not admit of being stretched like india-rubber, and then, unlike this material, of being retained at any required length. The object is not to stretch tissue already formed, but to regulate the length of new material during its formation. This can be accomplished with ease and certainty where no

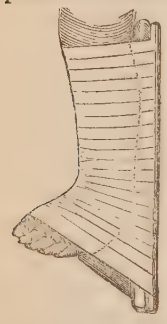
ligamentous resistance exists, as in most of the non-congenital deformities; but where much ligamentous rigidity exists, as in severe cases of congenital varus, it is sometimes impossible to gain the required length before complete reunion of the divided tendon has taken place, and then the acquirement of any additional elongation is so tedious and uncertain, that a re-division of the tendon may be advisable. I have already alluded to this subject in speaking of the mechanical treatment of talipes equinus, and stated that the rate of extension must be regulated by the activity of the reparative process in the divided tendons. In well-nourished infants the required length should be obtained in a fortnight, while in paralytic limbs it should not be obtained in less than from six to eight weeks.

With regard to the second point, viz., the restoration of form by elongation of the contracted ligaments, it is scarcely necessary to observe that the rate of extension may proceed as fast as the circumstances of the case permit, having regard to the condition of the tendon, the avoidance of pain, and the prevention of abrasion or slough from local pressure.

The Mechanical Treatment of Infantile Varus.—This may be conducted on an extremely simple and efficient plan, if one great practical rule be strictly adhered to, viz., *the division of the treatment, both operative and mechanical, into two stages;* the object of the first stage being to overcome the inversion of the anterior portion of the foot, and thus convert a case of talipes varus into one of equinus; and the object of the second stage being simply to cure the equinus. There is no claim to novelty in this twofold division of the treatment. Scarpa, in his mechanical treatment of this deformity, adopted precisely the same plan. He aimed at curing the severest forms of varus, up to the age of ten or twelve years, and from his excellent description we find that he accurately appreciated the mechanical conditions as I have described them, in reference to the two great centres of motion, viz., the transverse tarsal joint and the ankle-joint; and the different planes in which the anterior and posterior portions of the foot move in the production of this deformity. The treatment of the severe forms of varus has always been conducted upon this principle at the Orthopædic Hospital, but it does not seem to be generally known to the profession. Surgeons usually divide the tendo-Achillis at the first operation, and this, I need hardly say, is at once fatal to the principle of treatment I am now recommending. It may be thought that tenotomy, by at once overcoming the great obstacles to the restoration of the foot, supersedes the necessity of this twofold division of treatment, but, except in the slighter forms of infantile varus, it does not do so; and the explanation of this fact will be found in the adapted shortening of the ligaments in severe cases, upon which I have already laid so much stress.

In slight infantile cases, then, you may divide all the tendons recommended to be divided, viz, the tibialis anticus, tibialis posticus,

flexor longus, and tendo-Achillis, at the first operation; and after the foot has been retained in its deformed position by a bandage and splint for three days, you may apply the Scarpa's shoe, and gradually, in the course of two or three weeks, bring the foot into its natural position. *In all severe infantile cases*, or I would say in all those cases in which any ligamentous rigidity appears to exist, I strongly recommend you to divide the treatment into *the two stages above recommended*. In these cases first divide the tendons of the tibialis anticus and posticus, the flexor longus digitorum, and, if necessary, the extensor pollicis muscles; then bandage the foot in the deformed position to a splint, as recommended, and on the third or fourth day, the cutaneous puncture being healed, commence *the first stage of the mechanical treatment*, the object of which is the complete eversion of the anterior part of the foot. The best and simplest method of accomplishing this is by the application of a straight splint along the outer side of the leg, as represented in the accompanying figure. The splint should reach above,



nearly to the knee, and inferiorly should extend a little below the foot. The splints we use are made of tinned sheet-iron, well padded. The advantage of this material is that it can be be bent a little outwards at the lower end, as the foot is becoming fully everted. First bandage the foot and leg, then apply the splint, and begin to bandage from above downwards, so that a firm lever-power may be established; then pass the bandage round the foot, and draw it towards the lower end of the splint, as shown in the figure. The eversion of the foot must be done gently and very gradually, the apparatus being removed every other day, that undue pressure may be avoided. By this means you will be enabled to overcome the eversion, and draw the foot into a straight line with the leg, in about two or three weeks; in very severe cases a little longer time may be required. It is better this stage be delayed too long, than that the second stage be commenced too soon.

When the eversion of the foot is complete, and there is no longer any resistance to be overcome in carrying the foot completely into the equinus position, the second stage of treatment may be commenced by dividing the tendo-Achillis. The object of the *second stage of the mechanical treatment* is to flex the foot at the ankle-joint, and in so doing to gain the required amount of elongation of the tendo-Achillis. This object must be accomplished gradually, for the reasons I have already given, and the apparatus best adapted to the purpose is the Scarpa's shoe, or the modification of it I have suggested and delineated. (See fig. 2, "Retrospect," vol. 33, 1856, p. 214.) This is a most scientific instrument for equinus, but a most unscientific instrument for varus, where any ligamentous rigidity exists, and, as I shall

presently show you, was never employed by Scarpa for overcoming the inversion of the foot. The flexion of the foot must be regulated by the cog-wheel placed opposite the ankle-joint; and in about a fortnight the foot may be brought into its natural position, and the required elongation of the tendo-Achillis obtained. At the end of this time, or it may be longer if ligamentous rigidity exists, passive motion may be commenced, and the Scarpa's shoe used simply as a retentive apparatus. I usually direct passive motion—flexion and extension of the ankle-joint—to be continued for a quarter of an hour twice a day. About the end of the fourth or fifth week, if the tendo-Achillis should appear to be strong, the Scarpa's shoe should be worn only at night. In the day time the child may then wear an ordinary cloth boot with a steel spring, or a very light straight bar attached to the outer side, having a free joint corresponding to the ankle-joint, and connected above with a circular strap round the calf of the leg. A stop-joint is generally recommended at the ankle, but I much prefer free motion, because the exercise is thereby facilitated, and where this is neglected I doubt whether the stop-joint will prevent recontraction of the tendo-Achillis. I rely more upon the frequent and regular employment of passive motion than any mechanical aid.

Mechanical Treatment of Congenital Varus after the Period of Walking, and in the Adult.—I have already explained to you that the severity of talipes varus becomes much increased after the period of walking, not only in consequence of the adapted growth of the ligaments, and the persistence of the deviations in the bones, but by the influence of the superincumbent weight in the act of progression, which is transmitted to the ground at first through the outer border of the foot, and subsequently through the exposed anterior articular surface of the os calcis; the exposed portion of the head of the astragalus; the cuboid bone, which is gradually changed in its position, so that its superior surface looks directly downwards; and through the fourth and fifth metatarsal bones. Thus we find with respect to the four movements described as occurring in the production of varus, that only the first two—viz., extension of the foot, and inversion of the anterior portion—constantly exist in infantile cases; whilst, after the period of walking, the third and fourth movements—viz., shortening of the foot, and rotation of the anterior portion—are found to exist in an increasing degree, and are constantly present, as well-marked characters of the adult deformity.

In children from five to ten years of age, a period within which they frequently come under treatment at the Orthopædic Hospital, the same mechanical means may be employed as in the infant—viz., a straight splint for the first stage, and Scarpa's shoe for the second; and when the ligamentous rigidity is not considerable, the same method may be adopted at a much later period, especially in females; but severe and rigid cases, even in children, are better treated by the apparatus which I shall presently describe as especially adapted for adult cases.

In adult cases, the Scarpa's shoe, as represented in fig. 1, (see 'Retrospect,' Vol. 33, 1856, p. 214,) is the apparatus generally employed at the Orthopœdic Hospital; and it must be admitted that the most successful results have been attained by the use of this instrument, even in the most severe cases, up to the age of thirty years, or beyond, in some few instances; but in discussing the merits of the apparatus, as judged by its results, the extraordinary amount of attention which these cases receive at the hospital must be borne in mind. The surgeon conducts the whole of the treatment himself, and a very competent "sister" is always at hand to check any indications of undue pressure. Under such circumstances, therefore, it cannot be matter of surprise that good results should follow the application of an ill-adapted instrument. For the very severe cases, a modification of the Scarpa's shoe has been employed by Mr. Tamplin, which consists in the addition of one or two cog-wheels placed above those marked *k* and *l*, corresponding to the ankle-joint; and also in carrying the apparatus up to the thigh by means of a straight trough, without any motion at the knee-joint. By these means the power of adaptation and the range of motion in the Scarpa's shoe part of the instrument are increased, and the apparatus is rendered more fixed by the trough, but all the essential errors of the Scarpa's shoe, which I shall presently describe, are retained; and in consequence of the length of time the apparatus has to be constantly worn,—from a year to a year and a half, or perhaps longer,—a state of rigidity of the knee-joint is apt to be induced, which I have known it to take three months to overcome, the gradual flexion of the knee being very painful to the patient.

A very difficult part of the treatment of talipes varus in the adult, and one for which no provision whatever exists in the construction of the Scarpa's shoe, is what is called "unfolding the transverse arch of the foot." According to the anatomical description I have given you of this deformity, this would be more correctly described as "overcoming the rotation of the anterior portion of the foot," by restoring the cuboid bone to its normal relations. I have shown you that in some severe adult specimens, the transverse arch of the foot is not really contracted, —that the fifth metatarsal bone is not abnormally approximated to the metatarsal bone of the great toe,—but that the aspect of the sole of the foot is so far changed, that it looks directly upwards and backwards, in consequence of the cuboid bone, and with it the fourth and fifth metatarsal bones, being carried backwards by the influence of the superincumbent weight in the act of progression; and that the superior surface of the cuboid bone looks directly downwards, and transmits the weight of the body directly to the ground. An appearance of narrowing in the transverse arch of the foot results from this change in the relative position of the tarsal bones and of the phalanges; and externally is added to by a longitudinal fold in the skin, or furrow described in the external appearance of the foot in adult varus.

This so-called "unfolding of the transverse arch of the foot," or, as

it may be more correctly called, "the restoration of the cuboid bone and corresponding metatarsal bones, to their normal position," cannot be accomplished by any simple everting power, such as the side-spring of the Scarpa's shoe, or the straight splint which is sometimes used, even in the adult deformity. It has seemed to me that the appearance of narrowing of the transverse arch of the foot is increased after the foot has been everted by the straight splint.

At any rate, it is found in practice that some special apparatus must be employed "to unfold the transverse arch of the foot." Mr. Tamplin uses a contrivance by which an uplifting force is applied to the cuboid and fifth metatarsal bones, and at the same time a depressing force is applied to the inner side of the dorsum; the force is regulated by a screw placed on the dorsum of the foot. Mr. Lonsdale uses a very ingenious screw apparatus of his own invention with a similar object, attached to the sole of the Scarpa's shoe. The necessity for any special apparatus for the above object is, however, superseded by the apparatus which I have invented for the cure of adult varus. By this instrument any amount of uplifting force can be directed against the cuboid bona and the fifth metatarsal bone, at the same time that the foot is being everted.

Relapsed Cases.—[There can be no doubt but that cases of talipes varus, in which the deformity has returned, even after well-conducted operations, are numerous in our past experience.]

What are the Causes of this Tendency to Relapse?—In answering this question, especially in reference to severe cases, it appears that we must either assume the existence of an inherent tendency to relapse—an opinion entertained by Dr. Little—or believe that the tendency to relapse essentially depends upon some defect in the primary or after-treatment. I hold the latter doctrine as applicable to all the cases in which the primary treatment can be successfully adopted, *i.e.*, in which the deformity can be removed; and the only exceptions, I believe, will be found in those rare cases of arrested muscular development, affecting the anterior and outer muscles of the leg; and even in these, although an inherent tendency to relapse undoubtedly exists, such an event, I believe, may be prevented by a continuance of mechanical means, as in paralytic cases.

The absence of any evidence of disturbed muscular action—any spasmodic affection—after the removal of the deformity, is adduced by some as an argument against the dynamic origin of varus. But Dr. Little lays great stress upon the tendency to relapse depending in many cases upon a continued disposition to "tonic contraction" in the muscles which produced the deformity, and therefore regards the tendency to relapse as depending upon the continuance of this disposition, and at the same time as evidence of the spasmodic origin of the deformity. He observes, "Now it is obvious that if the dynamic property of the muscles of a joint be intact, and entire flexibility be obtained,

either with or without operation, no tendency to relapse should exist; for if the muscles originally contracted be right in their functional activity, ordinary exercise would, as in the case of a sound limb, maintain the flexibility. But although volition exists in the former structurally shortened muscles of a recovered club-foot, a tendency to re-contraction—tonic contraction—does in many cases (especially those most affected), exist." In other cases in which the dynamic cause has subsided, Dr. Little observes that the deformity is little inclined to relapse.

Now, it appears to me that a sufficient explanation of the tendency to relapse, in all but the exceptionable cases previously adverted to, will be found:—1. In the induced conditions of the various tissues involved in this deformity—such as the adapted growth of the bones in the deformed position, more especially the astragalus; and also the adapted growth and relatively altered length of the ligaments; and 2. In the imperfect extent to which these induced conditions are frequently removed in consequence of the great length of time necessary for the complete restoration of these deviations, when severe, leading as it frequently does to the neglect of the after-treatment. Therefore, to me it appears quite unnecessary to suppose the existence of any inherent disposition to relapse, such as a continuing influence of the original producing cause of the deformity. Moreover, there is no evidence of the continuance of any spasmodic tendency, unless the fact that the deformity does sometimes return be so regarded, and to this conclusion I cannot assent.

The principal causes of relapse, then, which I recognise in the ordinary cases of varus, however severe, have reference to some defect either in the primary or the after-treatment, when the case is submitted to treatment at a sufficiently early period; and may be arranged under the following heads:—

1. Defects in the operative treatment consisting of—(*a*) omitting to divide one or more of the contracted tendons, or more correctly speaking the tendons of contracted muscles; (*b*) incomplete division of tendons; (*c*) division of the tendons in a wrong order; (*d*) inflammatory adhesions following clumsily performed operations, or some of the accidents, such as aneurism, &c., which may occasionally occur.

2. Neglect, or discontinuance of the after-treatment, either mechanical or physiological.

Other causes of a tendency to relapse may also be mentioned, and it is certain that this may arise.

3. From the treatment not being commenced at a sufficiently early age.

4. From congenital defects of muscular development, such as absence of the anterior and outer muscles of the leg above described.

It would be tedious and unnecessary to relate the details of relapsed cases from all these various causes, I will therefore merely advert to some of the leading facts connected with them,

1. In reference to the defects in the operative treatment, I have already stated that the posterior tibial tendon was not divided subcutaneously in infants till the year 1842, previous to which it was either performed by open wound, when its division appeared to be absolutely necessary, or its division was altogether omitted. The general opinion was, that the tendo-Achillis and the anterior tibial were the principal tendons requiring division. I believe Stromeyer held this opinion, and it appears to be entertained by some surgeons even at the present day.

The division of the posterior tibial tendon, therefore, was very frequently omitted, and as a consequence of this omission I believe the more severe cases very commonly returned. I base this opinion mainly on the relapsed cases which have come under my own observation in private practice, and upon the well known fact that since the subcutaneous division of this tendon has become the rule of practice in cases even of a moderated degree of severity, relapse of the deformity has been of less frequent occurrence.

With regard to the incomplete division of tendons, I have examined two cases after death (from causes not connected with the deformity), in which the posterior tibial tendon had only been cut half through in the operation performed for the cure of the deformity. In one of these cases the operation had been performed by a leading Orthopædic surgeon, and in the other by a distinguished hospital surgeon of this metropolis, and therefore this must be regarded as an accident which may occur, even in practical hands. I need hardly say that if it should occur in a severe case, the cure of the deformity must be incomplete, and relapse therefore certain.

With regard to division of the tendons in a wrong order, as a cause of relapse, I would observe that the error most frequently committed is dividing the tendo-Achillis at the beginning instead of at the end of the operative treatment. The effect of this in severe cases is, that sufficient elongation of the tendo-Achillis is not obtained, in consequence of the difficulty of accomplishing by mechanical treatment at the same time all the objects required in the restoration of the deformed foot. The tendo-Achillis, therefore, remains as a shortened, or, as it is called, a contracted tendon, at the end of the treatment, and has a strong tendency to produce relapse of the deformity. I have already insisted upon the necessity of observing a definite order in the division of tendons.

With respect to the influence of "inflammatory adhesions following clumsily performed operations, or some of the accidents, such as aneurism, &c.," acting as a cause of relapse of the deformity, I would observe, that all subcutaneous operations leave behind them slight adhesions between the tendons and their sheaths; but when the operations are carefully performed, these adhesions, the inflammatory origin of which may perhaps be doubted, are very few, and extremely slender, so that they do not interfere with the free play of the tendons. The

absence of inflammation is the great feature in the pathology of subcutaneous operations; but when from any cause the operations are followed by a perceptible degree of inflammation, adhesions of a stronger and more important character take place. I have told you that I have witnessed suppuration along the tendons, and in case of division of the posterior tibial tendon, suppuration extending up to the popliteal space. I have also seen aneurisms produced by wounds of arteries in these operations. Now, in all these instances, and also when the same tendon has been the subject of repeated operations, close inflammatory adhesions must take place, and by their influence in limiting the free play of the tendons, an influence which is increased by their own inherent disposition to contraction, they become important agents in inducing a reproduction of the deformity. And of this I have witnessed several examples.

2ndly. The cases of relapse arranged in the second class, viz., those arising from "neglect or discontinuance of the after-treatment, either mechanical or physiological," are of the most frequent occurrence. I have laid great stress on the importance of careful attention to the after-treatment, and the necessity of employing such mechanical means as the case may require, as a retentive apparatus, during the time required by the bones and ligaments to adapt themselves to the normal position of the foot; and also the necessity of improving the muscular power by active and passive muscular exercise, champooing, &c. If by mechanical means, motion be allowed only in the right direction, and if by the physiological treatment, the moving agents, viz., the muscles, be proportionately improved, a sufficiently perfect state of ligamentous and osseous adaptation, and balanced muscular action, will be obtained, and all chance of a relapse of the deformity prevented; but neglect of any of these means in a case even of a moderate degree of severity will most certainly lead to relapse of the deformity.

A temporary neglect or intermission of the after-treatment may sometimes be unavoidable during illness, and under these circumstances a ready excuse for the relapse is found equally by the parents and by the surgeon; but it appears to me without sufficient reason, except when the child may have been the subject of some very protracted illness. In hospital practice neglect of the after-treatment is a frequent cause of relapse, where poverty, ignorance, and neglect are necessarily common among the class of patients we have to do with; and in private practice, the great length of time during which a continuance of the after-treatment is frequently necessary—perhaps three or four years in severe cases—renders it matter of little surprise that the parent should weary of this very tedious and troublesome treatment. Moreover, they commonly argue with apparent reason and plausibility, that as muscular weakness appears to be the most prominent condition of the limb, mechanical support must retard and interfere with the increase of muscular strength. In this they are frequently

supported by their medical attendant, who says, "The child cannot gain strength so long as it wears the steel supports." Now, this prejudiced and erroneous opinion, which is so frequently urged against the mechanical treatment of curved spine and all other deformities, ought to be at once eradicated from the professional mind. The fact is, that this is not merely a question of muscular strength, but a question of strength and position combined. An increase of muscular strength might, perhaps, be gained in some cases by discontinuing the apparatus, but if irregular muscular action be allowed to remain uncontrolled, the deformity will certainly return; and in cases of congenital varus, diminished instead of increased muscular strength will ultimately result, as a consequence of the wasting of the recontracted muscles. I have repeatedly known patients, acting under the advice of their medical attendants, discontinue the mechanical supports, and trust to rubbing, sea-bathing, &c., instead of combining all these accessory means of treatment, and a relapse of the deformity has been the necessary and inevitable result. I have a young gentleman from Oxfordshire, eight years of age, now under my care, whose club-foot had been cured, or rather the deformity removed, three times previously at intervals of two years. The relapse appears to have been the result partly of neglect of the mechanical treatment, but principally the omission of the physiological means, which were not directed to be employed by the surgeon under whose care he had previously been placed. After great perseverance I have succeeded in again restoring the foot, and the motion at the ankle-joint and muscular power of the limb are rapidly improving under champooing and passive exercises, a anticipate complete and permanent success.

3rdly. With regard to the treatment not being commenced at a sufficiently early age, as a cause of relapse, I would observe that the difficulty of curing the deformity—both with respect to the anatomical and physiological condition of the various tissues involved—is always proportionate to the lateness of the period at which the treatment is commenced, because during growth the bones become ossified in the deformed position of the foot, and therefore retain their imperfectly developed forms; the ligaments become adapted to the abnormal conditions of the bones and joints; and the contracted muscles remain imperfectly developed, and also become more or less degenerated from disuse. It must therefore follow that as the cure is necessarily imperfect, a proportionate tendency to relapse exists in the cases operated upon at a late period.

4thly. With regard to the last cause of relapse mentioned, viz., congenital defect of muscular development, such as absence of the anterior and outer muscles of the leg, I have dissected two cases, already described, in which this congenital defect existed, but in neither of them had any operation been performed. A tendency to relapse, however, would certainly have existed, though return of thevieformity might probably have been prevented by some form of retented appara-

tus which the patient would have been obliged to wear during the remainder of life, as in severe paralytic cases. Fortunately these cases are extremely rare.

The causes of relapse to which I have now directed your attention are, as regards those arranged in the first two classes, entirely within the control of the sur..eon and the parents, provided the surgeon has the opportunity of treating the case at a sufficiently early period. And the cause arranged in the third class is also very frequently within the control of the surgeon, because it is generally by his advice that the operation is delayed. The cause arranged in the fourth class being essentially a congenital defect of development, is of course beyond the reach of art, but its influence may be in a great measure controlled.

Treatment of Relapsed Cases.—Having described to you the various causes which produce relapse of the deformity, I need hardly say that the treatment will necessarily vary according to the circumstances of the case. Speaking generally, the ultimate results of treatment in such cases are much less favourable than in cases in which treatment is undertaken for the first time. This depends partly upon the time lost and the structural changes thereby induced; and partly upon the effects of previous treatment, especially in reference to the adhesions of the tendons to their sheaths and neighbouring fasciæ, as above described. Such cases are therefore in a less favourable condition for operative treatment, and it is advisable to persevere with mechanical and physiological treatment as long as any advantage can be gained by it, before repeating the operations. In most cases, however, it will be necessary to re-divide one or more of the tendons, and the division of the tendo-Achillis alone is often sufficient. Sometimes the anterior tibial also requires division; and in the majority of cases it is also necessary to divide the plantar fascia. Occasionally the posterior tibial tendon may require division, but much less frequently than the others. I have found this more especially necessary in the cases of relapse after the operations performed previous to the introduction of the subcutaneous division of the posterior tibial tendon in 1842, and in which this tendon had not been divided by open wound; or when the operation had been performed by surgeons little accustomed to treat these cases.

When any marked degree of inversion remains, and is accompanied with rigidity of the foot, I have adopted the plan of treating the case throughout as if nothing had been done, dividing all the tendons usually requiring division, and in the order which I have above recommended; and also dividing the treatment into two stages. Such cases of complete return of the deformity are more commonly met with in hospital than in private practice, and depend as much or more upon defective after-treatment as upon any defect in the primary treatment. In private practice, and in cases in which the after-treatment has not been neglected, the relapsed cases generally present the characters of equino-varus with severe contraction of the plantar fascia and struc-

tures in the sole of the foot. The heel is raised about an inch from the ground, and the anterior part of the foot inverted, more by the contraction of the inner band of the plantar fascia than by the tibial muscles. In cases originally severe the toes are often remarkably inverted, probably from the flexor longus muscle, the tendon of which had never been divided, remaining too short. The instep is very high and irregular from contraction of the plantar fascia, ligaments, and muscles in the sole of the foot. The foot is consequently very short and ugly. More or less inversion is apparent in walking, and the limited flexion of the ankle-joint produces lameness, and soon causes fatigue in walking exercise. As the patient walks principally upon the outer border and anterior part of the foot he is sure to suffer from troublesome corns in these situations.—*Medical Times and Gazette, July* 18 *and Aug.* 22, 1857, *pp.* 53, 183.

59.—ON UNNECESSARY ORTHOPŒDIC OPERATIONS.

By Dr. W. J. Little, Founder of the Royal Orthopœdic Hospital, &c.

[The object of Dr. Little in these papers is, to point out that in many instances in which the same external deformity exists, different treatment is required: in some, the knife being necessary; in others, (and this point is much overlooked) the deformity is better treated without operating.]

Infantile Congenital Talipes Varus, or Ordinary Club-foot. The usual treatment of varus, or common club-foot consists in section of three tendons, those of the gastrocnemii and of the anterior and posterior tibial muscles, succeeded by mechanical treatment, proportioned in amount and duration to the severity of the case. If the surgeon has not the necessary confidence in his operative skill, he severs the Achillis and anterior tibial tendons only, or perhaps he extends his operative interference to the plantar fascia. Now I desire to show that operation in *every* case of congenital club-foot is neither necessary nor desirable. Possibly many surgeons treat varus without operation, and the attempt to demonstrate the inexpediency of operating in every case may appear a work of superorogation. I know, however, that in London the rule is that of indiscriminate operation. Two of the ablest and most recent writers on the treatment of congenital varus, Mr. W. Adams and Mr. Brodhurst, whilst admitting the possibility of success without operation in very slight cases, strongly discourage the practice.

The objection to instrumental treatment, as opposed to surgical operation added to instrumental treatment, is the greater length of time said to be required to effect a cure. The answer to the objection is, that in those cases in which tenotomy is not required, the instrumental and manipulative treatment does not involve longer duration of treatment.

It is true, that with the aid of tenotomy, the deformity is more quickly removed, but whether or not operation be performed, professional treatment is equally indispensable in either case, until the child has acquired the art of correctly walking. The removal of the deformity is strictly speaking only the preliminary to restoration of the functions of the muscles and articulations; in short, the preliminary to the obtainment of a useful member. The habit of over-rating the necessity of tenotomy depreciates the value of instrumental, manipulatory, and physiological treatment. These at least are indispensable in every case.

The objections to *unnecessary* tenotomy are, that during a period that may vary from three to four weeks—i. e., during reunion of the tendons, it is proper to keep the ankle-joint at rest by means of suitable splints or apparatus, no manipulatory movements or passive exercises being permissible, (if any, very slight ones only;) that as a consequence of this immobility of foot in a greater or less bent position, *especially in the rapidly growing infant*, more or less limitation of ankle movement, or stiffness of ankle-joint, with corresponding weakening and wasting of muscles takes place; and lastly, that as a consequence of the division of the tendon, say the Achillis, and the subsequent facile bending of the foot, the belly of the muscle retracts, so that commonly the fleshy part after "cure" bears a smaller proportion than natural to the tendinous part, the calf being restricted to a higher part of the leg than natural. This excessive length of tendon may often be obviated by extreme caution and slowness in conduct of after-treatment, and by the tendency to re-contraction which the tendon often manifests two or three months, and longer, after operation. But these obviating circumstances destroy the peculiar value of tenotomy.

I am perfectly satisfied from many experimental trials, that where the contraction is slight and curable without operation, a higher development of the muscles of the calf, and consequently a more symmetrical limb may be obtained by cure without tenotomy than with its assistance. On the other hand, in severer cases, all the conditions —anatomical, pathological, and therapeutic—being different, the contrary obtains. In such cases, a more perfect limb results from the more speedy and effectual relief afforded by the operation.

I have elsewhere mentioned, that if we arrange all cases of congenital varus into three groups, according to the degree of deformity, it will be found that the whole of the third group, which is not the most numerous, and the majority of the second, the most numerous group, absolutely require operation, if we would cure the distortion within any reasonable period; whilst the majority of the first grade, and some of the second, may be cured without operation if the same pains be bestowed upon mechanical treatment and manipulations when the operation has not been resorted to, as are required when the operation has been performed. I again admit that the deformity of the ankle and

tarsal joints may be more quickly removed in every case with the aid of operation than without it, but I repeat, that the removal of deformity is not the only object in view, notwithstanding that the rapidity with which this result is often obtainable exercises a brilliant effect upon the bystanders, and creates one of the temptations to unnecessary tenotomy. It will be found, after patient observation and experience of the results of both methods, all things being equal, that of cases curable without operation, those which have been cured without operation present a nearer approach to the anatomico-physiological standard; that in the slighter forms, those in which a rapid and sometimes instantaneous removal of deformity has been effected by operation, the state o the divided muscles and tendons is less satisfactory than when no operation has taken place, the divided tendons (as readily perceived in the calf) often remaining disproportionately long, the muscular belly less developed, and a consequent disposition to excessive walking on the heel (talipes calcaneus) being induced.

My inquiry and practice were more perseveringly led into the direction of mechanical and manipulative treatment of milder cases of infantile congenital varus, by my having been startled by the examination of a well-marked double varus which had been completely cured, with fewer vestiges of the treatment employed than I had been accustomed to witness after resort to operative measures.

The pith of this paper is contained in the following advice:—When the movement at the ankle is very limited, when the foot can neither be abducted by steady pressure, applied by the hand of the surgeon for a quarter of a minute, nor bent upwards even to a right angle *whilst abduction is maintained;* when, in addition to that amount of contraction, one or more ineffaceable depressed lines on the integuments immediately above the os calcis exist; when the os calcis itself is very imperfectly developed, and seems as if tied to the back of the tibia and fibula by deep ligaments; when a deep constant cleft or cutaneous depression between the great toe and heel, on the inner margin of the foot, which constitutes a characteristic mark of varus, exists, caused by shortening of the plantar tissues generally, the case will not be cured without operation.

When, on the contrary, the foot can be drawn outwardly, and abducted by the hand of the surgeon, and be bent at least to a right angle whilst so abducted, by the use of gentle violence, even if some shrinking and crying be excited, a cure may be effected without tenotomy in a few weeks or months, or before the usual age at which sound children attempt to walk.

[When an operation is necessary, it should not be deferred longer than the second or third month of existence; but if the cure seems practicable by other means, the question of operation may be postponed till the approach of the age for walking.]

In the slightest cases amenable to mechanical treatment the nurse

may, by diligent rubbing, manipulating, or placing the feet in an improved position, remove the incurvation, even within the month. In cases somewhat more severe, in which a shortened condition of individual tendons is more apparent, the medical attendant may apply, by means of a roller-bandage, a well padded tin splint, bent to an angle somewhat less obtuse than that which the deformed foot naturally assumes, altering the angle of the splint from time to time as he finds the foot yield. The foot should first be covered with a few turns of the bandage.

The more decided is the incurvation of the toes the more necessary is it to direct attention to reduction of the varus to equinus (or pointed toe) before attempting to bend the foot.

The secret of success consists in applying the bandage and the splint with sufficient tightness to prevent its being continually displaced by the infant, but sufficiently loose not deeply to indent the limb, excoriate the integuments, or still worse, occasion sloughs upon the projecting heel or malleolus. It should be regarded as an axiom, that it is preferable that the apparatus should be repeatedly removed during the day rather than undue pressure be maintained, and that on no account it should be applied so as to cause crying, restlessness, or other form of suffering. Whenever the apparatus has become disarranged, soiled, or when purposely removed at least thrice in the twenty-four hours, frictions and manipulations should be practised. This part of the treatment may, and should be, conducted quite painlessly to the infant, and be gradually entrusted to an able parent, nurse, or assistant. The more frequently removal and manipulations take place, the less will the child complain of the process. It will be found, as a rule, in orthopœdic practice, that the attempt to move any articulation, after it has been long retained in one position, is painful, and is usually more or less successfully resisted by the child, according to its age.

By mere removal, the attendant may observe how his pains-taking application of the splint has been endured by the limb, what alterations in the mode of application seem desirable, to what extent improvement has rewarded his labours, whilst the infant is indulged in temporary freedom of action of the part.

By frictions, congestion and engorgement are removed, and the temperature of the part equalized. By manipulations, working and stretching of contracted parts, the joint is maintained free from rigidity, no set of muscles is permitted to atrophy from disuse, or to become contracted whilst another set is being elongated, which is a common consequence of weeks' sojourn unmoved in an apparatus. Above all, the contracted parts are, by manipulations, actually elongated, and the improved limb fitted for a splint more nearly approaching the form of the healthy foot.

I would here lay down another axiom in the treatment of this and many other distortions—viz., that the apparatus should be employed

almost less as a means of forcing the lapsed part into a good or a better position, than as a means of preventing its relapse into a bad position after use of manipulations.

Pasteboard, gutta percha, or moulded leather splints. may be used in lieu of those made of tin, but these are preferable. Every surgeon will employ with the greatest advantage that material or apparatus with the use of which he is most familiar. More depends upon his tact and diligence, as well as upon the perseverance of the patient's friends, than upon the apparatus selected.

If the case has not greatly yielded by the age of three months, or if difficulty is experienced in maintaining proper adaptation of the splint, a more elaborate instrument may be resorted to. The simplest, least expensive, and most effective is that modification of Scarpa's original instrument, sold by Ferguson under the designation of "Dr. Little's thumb-screw movement shoe for varus." It is less complicated, lighter than those manufactured with male and female screw, cog-wheel, or ratchet-screw movements, and has the peculiar advantage of not impeding action of foot in one direction. It consequently permits manipulation of foot in one direction without removal of it. Viewed theoretically, this apparatus seems incapable of the same powers of adjustment to a required angle whilst on the limb as other instruments, but in practice it will be found that it is convenient, on the few occasions on which it is desirable to alter the adjustment, to do it when the apparatus is removed. I may mention that even in adults this thumb-screw movement is preferable in all forms of foot-deformity where the greatest rigidity does not exist, especially when walking exercise may advantageously be permitted. By pursuing the treatment with the help of this instrument, aided by frequent removal, friction, and manipulation, precisely as in the treatment by splints, the practitioner will be surprised and gratified with the result in cases which may not have appeared promising.

In the treatment of infantile varus without operation, as with its assistance, it is, I repeat, of first importance to obtain eversion of point of foot before attempting depression of heel—in short, to convert the varus into equinus. It will be observed that after the condition of equinus has been obtained, and the attendant considers that bending of the foot alone remains to be effected, a constant disposition of the foot to roll over on its external edge manifests itself. In such cases the practitioner should never advance the screw which bends the apparatus, unless he is certain at each stage that he has effectually conquered the varus tendency.

A common complaint of nurses and others is, that they are unable to keep the heel down. This is a certain sign of the apparatus having been advanced in the direction of bending more rapidly than the foot has yielded. It indicates therefore that the apparatus must be put back into a less bent position. The surgeon should continually have present to his mind the axiom, *arte non vi*—gentle compulsion should

take the place of force; and on no account should he be tempted or betrayed into the use of such pressure and force as will occasion pain, excoriation, or sloughing, under any form of treatment. In the infancy of modern orthopœdic practice, owing to a prevalent belief that a cure after tenotomy was absolutely required to be effected before the tendons were firmly re-united, the more haste led to the less speed, and such consequences as excoriation, &c., were common; and my ingenuity was much taxed to devise means of pursuing the treatment under such unfavourable circumstances, whilst for many years past, in my own practice, with patients of all ages, I have not once seen so much as an abrasion of cuticle. Nothing is so much calculated to embarrass the treatment, or even defeat it, whether or no the surgeon has resorted to operation, as the occurrence of a wound through undue pressure upon a part, the integrity of which is essential, as the fulcrum upon which all apparatus is called upon to act. Under instrumental treatment, wounds can only arise through ignorance, negligence, and impatience.

If the progress made does not correspond to the pains taken, and the essential characters of the talipes varus are almost as marked as at the outset, or are even more strongly marked, the surgeon must conclude that he has either selected an unsuitable case for instrumental treatment, or that some accidental or other cause has neutralized his efforts; and such causes are easily found amongst the difficulties of orthopœdic practice, such as unfavourable health of patient, remissness or want of skill of nurse or patient, an unwonted leaving off of apparatus either by day or night; and he must therefore, without further delay, if the child is approaching the time for walking, perform the necessary operation, remembering that, as the operation is an important, or in severe cases, an indispensable adjuvant, he will have similar difficulties with the instrumental treatment after operation to those he has encountered before it. These difficulties are nevertheless surmountable by the surgeon who, with proper knowledge of his profession, and the necessary mental qualities, has the requisite time at his disposal.

Treatment of Imperfectly-Cured, Relapsed, or Neglected Cases of Talipes Varus.—[The cases of this nature are numerous, and the subject, if for the sake of orthopædy alone, is of much importance.]

As a striking instance of the liability of congenital talipes varus to recur, I may relate one which has recently passed from my hands. I operated on the subject of it, a male infant brought from Australia, seventeen years ago. The tendons divided were the Achillis, the anterior tibial, and the posterior tibial. The last of these was divided, not subcutaneously, but by exposure of it. At two and a half years of age the child was returned to Australia "cured," with the usual directions to the friends and medical adviser as to perseverance in rubbing, working of feet, exercises in drilling as soon as capable of them,

and right use of retentive apparatus. At six years of age he reappeared here, the foot entirely relapsed as regards the contraction, and aggravated as regards the form and relations of the bones and ligaments, caused by walking on the deformed member. I repeated the former division of tendons, this time all subcutaneously, the posterior tibial below the site of former operation, and severed likewise the plantar fascia. At eight years of age he again returned to Australia, walking perfectly well, only the foot was more atrophied than at his first dismissal from treatment. As if to illustrate the difficulty of parental and even professional management of such a case, at that period at the antipodes, he again visited me at the age of thirteen, the foot again quite distorted, evidently threatening to be regarded as an inveterate deformity. This time I was not inclined to waste the credit of tenotomy. I had, moreover, ascertained by experience how much may be done with a relapsed case without operation, and was desirous of convincing the friends that the relapse was due to neglect of the cautions I had given, and not to any deficiency in the method of treatment which had been adopted. I advised instrumental, manipulative, and physiological treatment, which was conducted under my directions, the boy being placed at school in the country, and not laid up or confined to the house a single day. The improvement was rapid; the patient has become an unusually tall man and a good cricketer; the gait, when he is not fatigued, is perfect; the only traces of the deformity consist of the ordinary want of beauty in the once varus foot, the elevated situation of the calf, and deficiency of muscular development.

The ordinary causes of similar relapses are—incompleteness of first "cure," through insufficient number of tendons having been divided, or insufficient elongation by instrumental or other treatment of the ligaments and muscles not reached by the operation; premature discontinuance of instrumental and attendant manipulation, as well as gymnastics, or studied exercises of the member.

A formidable pathological cause of return of deformity after treatment conducted with or without operation is, that whilst the recently-elongated muscles and tendons are, through more or less protracted duration of the deformity, inferiorly organized and grow less than unaffected parts, the bones and muscles upon the originally uncontracted side of the member, having been but slightly, or not at all, implicated in the original cause of the distortion, grow at a greater pace; and thus the mode of progress of the act of nutrition favours a disproportion between the length of some of the muscles and between one portion of the latter and the bones. This natural pathological tendency to relapse requires to be counteracted by the similar course necessary in any disease—viz., by the medical practitioner taking care not to regard a case as "cured" so long as a trace of contraction remains, and by sedulous use of some of the means used for the cure—in this case by active and passive exercises, sometimes by instrumental and retentive appliances.

Cases of this description are continually passing from one practitioner to another. I have been consulted in many instances in which the blame has often been unjustly thrown upon the operator. I know of such cases having been temptations to unnecessary tenotomy. I have long ceased to re-operate them; I find that they can generally be restored by due pains in mechanical management, by thoroughly explaining to the patient or parent the circumstances which have favoured relapse, or have prevented full realization of the benefits obtainable from the subcutaneous tenotomy of Stromeyer, and by teaching them in what manner manipulations and physiological exercises of the part can best be conducted. In a few exceptional cases, in which a necessary section has been omitted, or no evidence exists of elongation of tendon by former operation, repetition of operation, or completion of it, may be necessary. I mention the fact of the late justly-celebrated Dieffenbach and Phillips having practised numerous repetitions of section of the tendo-Achillis in the same individual, for the purpose of assuring my readers that this is never necessary. Such a course proves that in the earlier stage of the history of tenotomy sufficient attention was not paid by those surgeons to other modes of cure. Even in the severest adult varus, cases requiring more than a year's treatment, I do not remember ever having re-operated more than twice or thrice on the same limb, and even this I now consider excessive.

Whenever retraction of the belly of the muscle is observed, and the tendinous part disproportionately long, although this may be tense and rigid, and the movements of the articulation imperfect, the surgeon may safely determine that the maintenance of deformity is due to shortened ligamentous, muscular, tendinous, and fascial structures, situated beyond the reach of the knife, or to abnormal form of articulating surfaces.

I believe that hundreds, nay, thousands of cases, exist of incompletely cured or relapsed varus, in which the surgeon needs only to direct efficient instrumental, manipulative, and physiological treatment to enable him to realize all the good which subcutaneous tenotomy is capable of affording. I form this opinion from the circumstance that I now have brought to me for consultation a larger number of such cases than of primitive infantile varus.

In the majority of instances, it will be found that the part has only partially relapsed, the heel and the inner margin of the foot being more or less elevated, a portion of the sole being applied to the ground. In the treatment, discontinuance of the use of the limb is rarely necessary; sometimes it is required during two or three weeks, until the principal part of the elevation of the inner margin of the foot is removed. The "bringing down of the heel," as it is termed, is much facilitated by exercise upon the limb whilst it is held in an everted position by a proper instrument. In such a case, the use of an apparatus which does not absolutely confine the ankle-joint is a matter of prime importance.—*Lancet, July* 11, *Aug.* 8 *and* 15, 1857, *pp.* 28, 133, 162.

ORGANS OF CIRCULATION.

60.—CASE OF SUBCLAVIAN ANEURISM, CURED BY DISPLACING A PORTION OF ITS FIBRINOUS CONTENTS.

By Robert Little, Esq., Lifford.

[Compression, unfortunately, is not practicable in cases of aneurism of the subclavian and innominata arteries—and tying these arteries, whether above or below the tumour, is neither desirable nor justifiable. Mr. Fergusson's mode of treatment, however, holds out brighter prospects.]

He has proposed that a portion of the fibrinous contents of the sac should be displaced, and directed towards the axillary and brachial, so as to obstruct the distal end of the artery, and thereby arrest the current through the aneurism; and a case so treated by him has been alluded to in the 'Lancet' for September, 1855. A similar one having occurred in my practice, I shall offer no apology for bringing it before the notice of the profession, conceiving it to be a case of great practical interest and importance, and that it is the duty of all, so far as in their power, to contribute their mite towards the elucidation or establishment of a novel mode of treatment, especially when applicable to a class of cases hitherto almost regarded as beyond the pale of surgery.

Daniel McMonagle, an albino, aged 53, admitted into the County Donegal Infirmary on the 6th October, 1855, with an aneurism of the right subclavian artery, gives the following history of his case:—States that, having been in the habit of dealing in eggs and fish, which he usually carried through the country in a basket suspended on his back by means of straw ropes through which he passed his arms, he first felt pain in the right arm in the preceding month of March, which gradually became so severe that in the month of May he was frequently obliged to sit down on the road-side and remove his burden for a time. Soon afterwards he discovered a tumour above the right clavicle, directly corresponding to the site on which one of the ropes pressed, which also became painful after a short time; and in the beginning of July he perceived "a beating in the lump," which then began to enlarge rapidly. In the month of August he says he had such a feeling of drowsiness that for a fortnight he slept the greater part of each day and night, during which time he lost his appetite and took nothing but milk, and at this time he was unable to bend his fingers. Sleep then suddenly deserted him, and he declares that for a fortnight prior to his admission into the Infirmary he did not sleep for a single hour, owing to the intensity of the pain in the tumour and along the arm.

Symptoms on Admission.—A tumour equal in size to the largest goose egg occupies nearly the entire of the supra-clavicular region, extending from the clavicular attachment of the sterno-cleidomastoid to

the acromial end of clavicle, which has a strong pulsatory movement that is visible from the most remote part of the ward, and is accompanied with a loud bruit de soufflet; it is soft and compressible, and is red and somewhat inflamed on the surface, from which circumstanced Dr. Greer, under whose notice the patient first came, greatly feared the aneurism would have burst. There is no appreciable dulness on percussion under the right clavicle, but the respiratory murmur is not as distinct as on the opposite side; however, this may arise from its being somewhat masked by the loud bruit on that side; the superficial veins of head and neck are considerably enlarged, but he does not suffer either from cough, dyspnœa, or dysphagia; tongue tolerably clean, pulse at wrist 80, and regular; appetite not good. His chief source of complaint is a severe and constant pain extending from the tumour down the right arm as far as the tips of the fingers, which he says is most acute about the middle of the humerus, and he is constantly compressing this part with the other hand, conceiving that it gives him some relief. At first he got sedatives, had cold applied to the aneurism, and each night had a full anodyne, which treatment somewhat moderated the violence of the pulsation, and made him feel more comfortable, and after a few nights when the anodyne had been considerably increased he got some tranquil rest.

In December he was bled twice from the arm, and ice was kept constantly applied over the tumour for three weeks, without any manifest improvement, except that the redness and inflammatory appearance of the integument covering the aneurism have completely disappeared; in other respects, the symptoms remain unaltered. Having seen the report of Mr. Fergusson's very interesting case, I resolved to follow his suggestion in this apparently hopeless one, and I must confess I did so without any very sanguine expectation of success. Accordingly, on the 1st of January, 1856, by making gentle but steady pressure with my thumbs alternately over the aneurismal sac, I succeeded in displacing some of the coagula, and directing them towards the distal end of the artery. No other local treatment was adopted, but he was ordered the persesquinitrate of iron internally. For the first two days no change was perceptible in either the tumour or the arm; but on the third day the pulse at the wrist was manifestly weaker, and the arm somewhat colder than the opposite one. These symptoms gradually increased up to the tenth day after the manipulation of the sac, when no pulsation could be felt in either radial, brachial, or axillary arteries. The tumour itself had now become more solid, and the bruit and pulsation were both diminished; the violent pain in the tumour and along the arm has also decreased, but now he complains of a sensation of coldness over the right shoulder and scapula, and of a severe pain extending along the side of the neck and back of the head, which increased in severity for a month, and the arm became greatly wasted, and partially paralyzed, retaining very little sensation and scarcely any power of motion.

March. All pulsation in the aneurism having now ceased to be visible, pressure was applied over it.

November. Both bruit and pulsation have completely disappeared; the aneurism is not more than one-third its original size, and is quite solid; the anterior edge of clavicle feels thin and sharp, from the absorption of its upper surface, caused by the pressure of the sac, and the pain along the side of the head and neck, heretofore so much complained of, has completely subsided. The arm has regained its natural temperature, and, although still considerably attenuated, he can use it tolerably well, sensation having also returned to it. A very slight pulsatory wave can now be felt in the radial artery, but not in either brachial or axillary. Two superficial arterial branches, of considerable magnitude, can also be traced, running in a transverse direction across the remains of the aneurism, one immediately above the clavicle, the other somewhat higher up.

March, 1857. Having again admitted the patient into the Infirmary within the last few days, for the purpose of examining his condition, the absorption of the tumour is steadily progressing, being now not larger than a walnut. Pulse at the wrist somewhat stronger than at last report, but still not to be felt in either brachial or axillary. Sensation and motion are completely restored to the arm. He is free from all pain, and says he feels perfectly well, and intends resuming his former occupation. I may mention, that most of my medical brethren in this locality having taken a deep interest in this case, and visited him from time to time while under treatment, have also seen him since his last visit to the Infirmary, and agree with me in considering the cure to be most satisfactory and complete.

It may be objected to this mode of treatment that it is of too dangerous a nature to admit of general application; still it is scarcely possible to conceive a more unpromising case than this was, the aneurism being of considerable size, soft and compressible, and so much inflamed on the surface that the medical gentleman who sent the patient to me was apprehensive of its bursting: still here we have had a satisfactory and unexpected result; and should subsequent observation and experience prove that this is not an isolated and exceptional case, it not only points out to us a mode of treatment applicable to those cases of aneurism where the ligature and compression are alike unavailing, but also seems to suggest the possibility of curing some cases of internal aneurism under favourable circumstances; and a hope may justly be entertained that the day is not far distant when curative measures may confidently be had recourse to in a class of cases hitherto regarded as hopeless and irremediable.—*Medical Times and Gazette, May* 23, 1857, *p.* 508.

61.—*On the Treatment of Nævi.* By J. Cooper Forster, M.B. Lond., Assistant-Surgeon to Guy's Hospital.—A case of nævus, of the mixed variety, about the size of a fourpenny-piece, was sent to me by

my friend Mr. Roper, of Shoreditch. I adopted the plan for its cure which I am in the habit of doing for small nævi, viz., passing two pins at right angles to each other under the mass, and placing one ligature around the whole, tying it tightly, and withdrawing the pins. In the course of four or five days, the nævus having shrivelled up with the thread, drops off, leaving an open sore to granulate, which it does rapidly or not, according to the condition of the patient, and an unsightly scar is necessarily the result. In the case to which I allude, the ligature came off accidentally four hours after it had been applied, and I feared that, probably, the usual result would not be attained, but was agreeably surprised to find that the nævus which had been tied dried up, and formed a shrivelled mass, under which the curative process went on without any suppuration; and when the whole dropped off, which it did in the course of twelve days, there was scarcely any scar to be seen. In consequence of the success of this treatment, I have been induced to adopt it several times since, in each case with the same result. I simply pass the pins at right angles to each other under the nævus, tie the whole in a bow knot, remove the pins immediately, and at the end of four hours untie the ligature. A scab forms, which drops off at the end of fourteen days or so, without any suppuration, open sore, or untoward result occurring.

The rationale of the treatment appears to me to be, that the vessels compressed by the ligature have the current of blood in them arrested for a time, but not sufficient to so entirely obliterate them as to cause the part encircled to slough at once. By this means entire destruction of the nævus is prevented, but sufficient obstruction is caused to allow the blood in the tissue to become consolidated; and the whole becomes atrophied and drops off, leaving scarcely any scar. When this plan can be adopted, I believe it will be found eminently superior to any other for the kind, form, and size of nævus I have mentioned; it is only a modification of the ligature, which I most unhesitatingly affirm to be the only plan of treatment to be adopted with any certainty of success, when the skin and areolar tissue are involved, when, indeed, we have what I am in the habit of describing as the mixed variety of nævus. In the subcutaneous form the injection with perchloride of iron produces, as I mentioned some years since, the most striking and salutary effect, and is applicable where no other kind of treatment can be adopted, owing to the locality of the disease; but it is only in a few cases, comparatively, that it should be used.—*Med. Times and Gazette, June* 13, 1857, *p.* 592.

62.—*On Superficial Aneurisms and their Treatment.* By M. Paul Broca.—M. Thierry imagined that he could obliterate varices by applying on the skin previously denuded by a blister, perchloride of iron. This application excites an inflammation that is propagated to the enlarged veins, in which it often determines the formation of

clots; but this obliteration is only transient, and the veins become permeable again after some days. M. Broca was aware of this fact; but furthermore knowing that arterial obliterations were more permanent than those of veins, he thought that the endermic method, inefficacious as regards varices, might furnish a better result in the treatment of those very superficial aneurisms of the scalp and frontal region. He was not mistaken in his expectation, for by one application of the perchloride on the denuded dermis he rendered definitively solid a cirsoid aneurism of the scalp, that had already existed four months, and was making alarming progress. On the fifth day the tumour was obliterated, and the patient, who was seen seven months after, continued perfectly cured. M. Broca adds, that he has cured in this manner several cases of those congenital nævi known vulgarly under the name of *wine spots*, and which, it is well known, are refractory to all modes of treatment. The proceeding consists in removing the epiderm by a blister, and then touching the denuded derm with a pencil of charpie, wetted with perchloride of iron, at 30° of the areometer of Beaume.—*Med. Times and Gazette, July* 18, 1857, *p.* 69.

63.—*Ligature of Varicose Veins in a Pregnant Woman.*—It is not a usual circumstance, as every accoucheur is aware, to perform any operation, even the slightest, on a pregnant woman; but, in the present instance, it was really necessary, as the patient, in University College Hospital, some months advanced in pregnancy, had varicose veins of the right leg, and a large varicose vein, which was almost constantly bleeding, so much as really to prove a source of great danger to life. It became a matter of some moment, therefore, to arrest this bleeding; and it was accomplished by Mr. Erichsen in the usual manner he is in the habit of employing of ligaturing veins—namely, placing pins under the veins, and tying them over a piece of gum-elastic bougie. We learnt that this procedure was quite effectual, without any bad consequence to the poor woman.—*Lancet, Aug.* 15, 1857, *p.* 169.

ORGANS OF RESPIRATION.

64.—TRACHEOTOMY FOR THE REMOVAL OF FOREIGN BODIES FROM THE AIR-PASSAGES.

By J. Cooper Forster, Esq., Assistant Surgeon to Guy's Hospital.

[Three interesting cases are related of foreign bodies in the air tubes. In two, the operation resorted to of opening the trachea was perfectly successful: in the third, death took place from great loss of blood. The patient in most cases prefers to lie on the right side, as

the foreign body is generally in the right bronchus. In none of these cases was chloroform administered, but Mr. Forster would not hesitate to exhibit it another time, especially in a restless child. Dr. Snow has administered it in a few cases. Mr. Forster says]

It is generally recommended that the trachea should not be opened until all external hemorrhage has been commanded and ceased, the propriety of which rule as regards a bleeding artery no one can doubt: but where the hemorrhage is altogether venous, as it usually is in these cases, the most advisable plan appears to me to be to relieve as quickly as possible the embarrassed circulation, and thus allow the blood to return to the heart, which, from the struggling of the patient and his violent straining, has necessarily been prevented. I therefore do not hesitate one minute longer than possible in passing a knife into the trachea, and opening it; as, directly the opening is made, and respiration has become established by the wound, the veins return the blood to the right side of the heart and the hemorrhage ceases.

I did not in any of these cases adopt the plan lately recommended by M. Chassaignac of fixing the trachea with a grooved hook, (which is passed through the integuments into it below the cricoid cartilage, and brought out at once with the handle resting on the chin of the patient, so that the necessary incisions may be made through the soft parts of the trachea on the groove,) as I should consider it a somewhat embarrassing plan, though not having used the instrument, I can but give a theoretical objection to it. But it appears to me there must be a great amount of difficulty to the operator from the restlessness of the patient, before the trachea is sufficiently opened to allow the expulsion of the foreign body, and yet that tube is, if I may use the expression, tapped by the hook. Any one who has performed tracheotomy must be well aware of the distress and suffocating symptoms occasioned for the first few minutes after the trachea is pierced, and before the opening is sufficiently enlarged.

On the other hand, the plan of lifting up a piece of the trachea like a flap with a common tenaculum, after the tube has been laid bare, and then allowing the foreign body to be expelled, and dropping the flap down again into its original position, is very advantageous. A case occurred in the hospital under Mr. Hilton's care, three years ago, and which is reported in the 'Medical Times and Gazette' of August 5th, 1854, where this ingenious plan was adopted, and the happiest result attained. The foreign body here was known to be an ovoid glass bead, which from its shape and structure there was very little prospect of being able to seize with a pair of forceps; it could only have been ejected by the patient during a fit of coughing through the opening, and hence the advisability of the proceeding in this case and others of a like nature.—*Guy's Hospital Reports, Vol. III*, 1857, *p.* 128.

ALIMENTARY CANAL.

65.—*Influence of Coffee in the Reduction of Hernia.*—M. Triger relates the case of a patient suffering under strangulated inguinal hernia, for which the taxis and ice had been employed in vain, and the operation seemed to offer the only chance. An old practitioner, Dr. Durand, from Havannah, however, ordered the man to take every quarter of an hour a cup of hot coffee, without milk, and with little sugar (60 drachms for 12 cups). After the fifth cup, gurgling was heard; and at the ninth, the hernia returned of itself. No application was made to the tumour, but the patient dipped his hands for a while in iced water,—a kind of *horripilation* resulting. Dr. Durand has repeatedly succeeded by this means, sometimes also applying a compress dipped in sulphuric ether to the tumour.—*Gaz. des Hôp.* —*Med. Times and Gazette, May* 16, 1857, *p.* 493.

66.—ON THE TREATMENT OF INTERNAL HEMORRHOIDS.

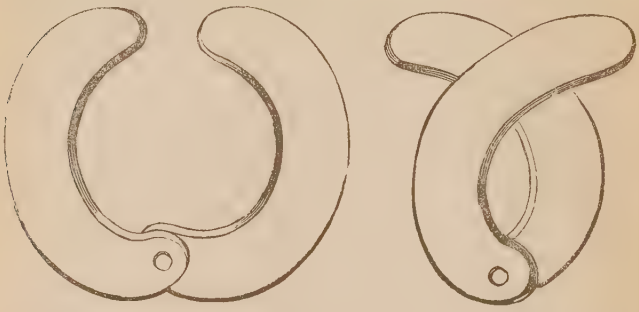
By J. Hamilton, Esq., Surgeon to the Richmond Hospital, Dublin.

In France, some surgeons prefer to destroy the hemorrhoids by caustics, and different instruments are used by them for the purpose. M. le Dr. Alphonse Amussat effects the application of the caustic of Filhos to the root of the hemorrhoid by a very ingenious forceps the invention of his father, or one with a modification of his own.

The transverse arms of the branches of the forceps, which seize the pile at its base, have grooves in them that hold the caustic, which previously to the application is covered by a slide. When the pile is firmly compressed by the forceps and kept so by it, the slides are rotated back, and the uncovered caustic comes in contact with the sides of the base of the tumour. The application is continued from two to four minutes, and during this time constant irrigation of the part with cold water is kept up by an assistant, and is continued afterwards, to wash away any of the particles of caustic that might remain; or this is more effectually accomplished by acidulating the water with a little vinegar. To those, however, who do not possess this ingeniously contrived forceps, a simple mode of proceeding is recommended, viz.:—to seize the hemorrhoidal tumour with the ordinary dressing or dissecting forceps, and cauterize it directly by applying to its centre a stick of Filhos' caustic pointed, and giving it a rotatory movement to penetrate the hemorrhoid, so as to destroy it both centrally and laterally. The neighbouring parts should be protected with spatulæ, and the whole washed with acidulated water after the operation.

If you apply the caustic directly, you need not trouble yourselves to make Filhos' caustic, or the Vienna paste, as a stick of the common caustic potash is quite as good. A very simple but ingenious means for its safe application is this instrument, invented by M. Jobert de Lamballe.

This method of destroying prolapsing or bleeding hemorrhoids, by destructive caustics, ought to be safe and effectual. I have had little experience of it, but M. Amussat brings strong evidence in its favour.



A liquid caustic, which destroys much more superficially, the nitric acid, is a great favourite with many surgeons in Dublin, and some in London. Mr. Cusack, was, I believe, the first to use it; but the late Mr. Houston has the merit of having called particular attention to it, by the publication of a number of favourable cases in the 'Dublin Medical Journal.' Though successful in many instances, and even in very severe ones, yet I do not place much reliance on it in the majority of cases of aggravated internal hemorrhoids, the relief being often only temporary, and when much is attempted by a very free application of the strong acid, the effects are by no means so trifling as have been generally described—considerable inflammation of the lower end of the rectum and anus with œdematous swelling around the latter—hemorrhage, from the acid causing a slough over a vein or artery—and severe pain, for many days after the application, of the surface burnt by the acid. The last effect was very troublesome in a case I saw with Dr. Brady, of Harcourt-street; the operation was effectual in a very aggravated case of prolapsing and bleeding piles, but the sufferings of the patient, from the raw surface left after the separation of some superficial sloughs, were extremely severe; from this raw surface also there may be more or less hemorrhage.

Mr. W., fifty-three years of age, three years ago had the nitric acid applied for prolapsus and bleeding piles; the bleeding to such an extent that he was quite bleached. It required two applications of the acid. After this he continued well till some time since, when the bowel again came down at stool, or even when he walked a short distance; a roll of mucous membrane prolapsing on the left side, the size of the first joint of the thumb; it was red and excoriated on the surface, and at the most superficial edge, under the thin integument, large veins were very apparent. At stool the descent is much greater,

two large livid tumours appear, raw on the surface and readily bleeding. He was in perfect health, but the annoyance of the prolapsus was very considerable.

May 6. As it was clear that a light application of the nitric acid would effect little in such a case, I applied it freely over all the surfaces till they were charred greyish-white; it gave pain when the surface was excoriated.

7th. Some uneasiness about the lower part of the abdomen, and more flatus than usual. He had a motion, which relieved him; and no prolapsus of the bowel took place. Two gentle purgative pills.

8th. Bowels moderately affected; scarcely any bowel came down, and it went up of itself; but there was a good deal of blood.

9th. Much irritation; the bowels twice moved, with pain, uneasiness, and sickishness of stomach; he had eaten too full a dinner, and walked about; I recommended rest on the sofa, low diet, and a pill of five grains of Dover's powder at bed-time.

10th. Passed a good night; had a natural motion this morning without uneasiness or prolapsus; there was some blood, but as it was coagulated it had most likely flowed into the rectum after the previous motion. He was so well that I took my leave. He went to the country, and six days after I received a letter from him, saying,—"I arrived here the 12th, and have been every day since bleeding very much each time I go to stool, and pass very little through my bowels; I should say I lose on an average half a pint of blood daily, and nearly fainted twice one day, in consequence. Otherwise, matters are well." I wrote to him, recommending the daily use of a lavement of cold water with a teaspoonful of powdered alum in it, expressing my belief that the bleeding came from the abraded surface caused by the severe application of the nitric acid, and that it would most likely cease in a day or two. I got a letter a few days after, saying that the bleeding had gradually ceased, and that he was quite well.

About two months after, he came to town; there was still a little prolapsus on exercising—an oblong excoriated firm portion. He was obliged to leave town the same day, so I could not apply the nitric acid a second time, which would probably have cured this. As it was, here was a case in which the acid had been so strongly applied, as to produce serious bleeding, and yet the result was not completely effectual. And the result of two previous applications, three years before, had been temporary. In Dunbar, No. 5 Ward, the acid had been freely applied in another hospital with little beneficial effect.

A Roman Catholic clergyman, aged about fifty, suffers from internal hemorrhoids, which come down at stool, and occasionally bleed; but what most inconveniences him is, that there is some prolapsus when he walks.

I found the anus lax, and a small red granular pile, like an elongated raspberry, projecting out through the anus; besides this, he says that after having walked some time, one from higher up, and of a dark colour, like a grape, comes down too.

He has laboured under this complaint for fifteen years, and been cured twice, for a time, by the application of nitric acid. The acid had been applied by a most experienced and excellent surgeon, and yet the effect had only been temporary.

But where the prolapsus and bleeding hemorrhoids are small, the nitric acid is a very safe and effectual remedy. There is a glass brush recommended for applying the acid. But you will find the common mode of application as good as any. A flat piece of wood, the size of a spatula, but a little narrower at the end, is to be wet with the strong acid and applied decidedly over the pile till its surface becomes greyish-white; a little oil is afterwards smeared over the part to prevent any free acid affecting the neighbouring parts. The chief things to be attended to are, not to take up too much acid with the stick lest it drop over other parts, and secondly, to apply it effectually. Some inflammation, heat, and throbbing follow the application, and after the second day, there is often blood in the stools. This, in favourable cases, gradually disappears as the ulcer formed by the acid heals, and the inflammation having consolidated the walls of the rectum, the internal piles cease to come down.

Now let me remind you, that all these cauterizing agents have been proposed as safer modes of curing prolapsing and bleeding piles, than the two older operations of excision and the ligature. That they are safer than excision, there can be little doubt; indeed I wonder any one can be found bold enough to cut off internal piles, when we have the evidence of so many lives sacrificed by it. Dupuytren, an advocate for excision, was yet so aware of the danger of hemorrhage, that he always left an assistant at the bed-side, to apply the actual cautery to the bleeding vessel in case it came on—rather a terrible addition to any operation. Sir A. Cooper lost some patients by this operation, and abandoned it in consequence.

Sir P. Crampton mentioned to me, that early in life he had nearly lost a lady from hemorrhage, after excision. As he could not get at the bleeding vessel to tie it, he had to keep his finger, and after he was tired, that of an assistant, on the vessel, up the anus for several hours.

The following case conveys a good warning of the extreme danger of this operation:—I was asked to see, in all haste, a man who was bleeding after having been operated on for piles by excision. He had suffered for a long time from internal piles which came down at stool and bled freely. One of these piles had been cut off an hour before, and as the young man who was staying with him observed him to pass large quantities of blood in the *pot de chambre*, and to be getting very weak, he became alarmed, and the gentleman who had operated not being procurable, he had sent for me. I found the man blanched, and so weak that when I told him to get on the pot, and strain, he was barely able to do so. He passed about half a pint of nearly pure blood, partly clots and partly fluid; the bowel did not come down,

therefore the vessel from which all this blood was coming was not visible. I introduced a gorget to enable me to find it, when it appeared high up above the internal sphincter, and was pouring out red blood per saltum, forcibly, running up into the bowel and out at the anus. This view was obtained with great difficulty, from his unsteadiness and being inclined to fall forwards from weakness, and the rapid flow of blood obscuring everything; indeed I never saw more furious bleeding from so small a source, and I am sure in another quarter of an hour, he would have been dead. I took up the vessel with a tenaculum and luckily the looseness of the parts allowed it to be dragged down, so that a ligature could be properly applied to it. The hemorrhage was stopped, and with the exception of palpitation of the heart he got well without any bad symptoms.—*Dublin Hospital Gazette, Sept.* 15, 1857, *p.* 273.

ORGANS OF URINE AND GENERATION.

67.—ON THE REMEDY OF STRICTURE BY EXTERNAL INCISION.

By James Syme, Esq., Professor of Clinical Surgery in the University of Edinburgh.

[It is now established that external incision is the proper remedy for cases of stricture which prove incurable by dilatation. But there are some points which require time and extensive observation for their complete elucidation; with respect to which the following observations are made by Mr. Syme.]

One of these is the question as to the permanency of relief afforded by incision, which could not be satisfactorily answered at an early period of this procedure. The first case in which I divided a stricture at the bulb, was the most obstinate and distressing that has ever fallen under my observation. It had existed twenty years, and resisted all the then known means of remedy, until the patient, wasted to a shadow, longed for death as the only termination of his sufferings. But this gentleman has now, for fifteen years, enjoyed the most exuberant health, and never required the introduction of a bougie. Other cases, of an equally encouraging character, originally led me to believe that the operation would always prove equally effectual, so as to render unnecessary any further treatment; and when, contrary to my expectation, relapses afterwards occasionally occurred, I attributed them to some imperfection in the process, either as to the performance or the subsequent management. The bad results of cutting without a guide, although most unfairly attributed to my procedure, had, of course, no bearing on the question; but I thought that, even when the operation was performed upon proper principles, its effect might vary with the extent of incision through the urethra, the mode of healing, by adhe-

sion or granulation, and the care that was taken to maintain dilatation during the period of recovery. Without going into the details of many trials and observations that were made to ascertain the truth of these surmises, I may state, as their general result, my persuasion, that while the free division of a stricture may afford not only complete but permanent relief, without the employment of bougies subsequent to recovery, it is not possible, by any modification of the process or treatment, to insure against all tendency to future contraction. On the other hand, it has been satisfactorily ascertained that the simple precaution of passing a full-sized instrument occasionally, as once in two or three months, will effectually prevent any risk of relapse; and as, when the canal is free from obstruction, the patient may readily do this for himself without the slightest difficulty or danger, the permanency of relief may thus be secured at the expense of very little inconvenience.

Many people have been deterred from adopting my proposal by the theoretical objection, that a wound of the urethra, like one of the skin, must heal either by adhesion or granulation, so as, in the former case, to restore the old contraction, and, in the latter, to form another of perhaps greater firmness by the resulting cicatrix. But, next to statistics, analogy is the most misleading guide to good surgical practice, and, in the words of an old writer, "one grain of fact is worth a pound of reasoning," as is well shown in regard to the question at present under consideration. For no one can now deny, that the most tightly contracted urethra has remained perfectly patent after division of the stricture, so as to permit the exit of urine and introduction of instruments with the utmost freedom. It has also been found, on examining the bodies of persons who have died several years after the operation, that the canal, so far from being contracted at the part where the disease had existed, was actually wider than natural, and, in respect to the surface or texture of its lining membrane, not distinguishable from the neighbouring portion which had been free from derangement. But the most satisfactory information on this part of the subject may be derived from those cases in which the stricture is seated at the very orifice of the urethra, where the effects of division admit of being ascertained beyond the possibility of doubt by actual inspection.

A. B., aged 34, an engineer in Demerara, had suffered from stricture of the urethra for seven years, and, latterly, so severely, as to leave his employment and return in quest of relief to this country, where, for twelve months, it had been attempted by dilatation and caustic, which, so far from alleviating, aggravated the symptoms. He applied to me, a few weeks ago, with hardly any hope of recovery. I found the penis swelled and deformed by abscesses and fistulous openings, of which one was midway between the glans and scrotum, and several were in the glans itself, which allowed the urine to escape as if from a watering-pan. The stricture was seated at the orifice of the urethra, where it formed a dense ring, presenting a small round orifice, which

admitted bougies of only the second or third smallest size, and grasped them tightly when withdrawn. From previous acquaintance with similar cases, I knew that a free division of the contracted part would, in all probability, prove an effectual remedy, and therefore accomplished this without delay, by inserting a small bistoury into the canal, and bringing out its point beyond the stricture, on its lower side, near the frænum. Instruments of the largest size could then be introduced without any difficulty, and the only treatment consisted in placing a piece of lint between the cut edges. Three days after this was done, the patient came to the hospital, declaring that "he felt quite a new man," with the organ nearly natural in regard to form and texture, and all his water passing by the natural channel. Before the end of a week, the wound had healed completely, so that it discharged neither blood nor matter, and, in respect to shape as well as surface, could not be distinguished from the natural orifice of a urethra. In another week, he felt so well as to sail for the West Indies.

Now, this case, in the first place, illustrates the unyielding disposition of some strictures to dilatation, since there can be no doubt that, if the contraction, instead of being at the orifice, had existed further back, it would equally have resisted all attempts to remedy it by such means, while their failure might have been attributed to unskilfulness of the operator, which could hardly be supposed when the disease was within view. But the speedy healing of the wound, without either adhesion or contracting cicatrization, affords a still more useful lesson, by showing how the space obtained through incision may remain undiminished, and thus completely answering the argument against division, which has been founded upon the assumed analogy between skin and mucous membrane in respect to the reparation of their wounds.

In originally proposing this method of treating obstinate strictures, I expressed the opinion, that as it could be conducted so as to prevent either hemorrhage or extravasation of urine, the results of its employment would prove free from danger; and a very large experience now enables me to maintain this persuasion. It is true, that death may occur to the extent of one per cent. or so, just as from any other operative interference, on account of some peculiarly unfavourable condition of the patient; but if the process is conducted in strict accordance with the principles which I have explained, it will be found one of the safest in surgery.

In illustration of the facility with which strictures of the oldest standing are remediable by external incision, I may mention the case of J. B., aged 56, who was admitted into the hospital on the first of January last. He stated that, upwards of forty years ago, when serving as a drummer boy in Spain, under the Duke of Wellington, he contracted a gonorrhœa, which was followed by stricture of the passage and progressive annoyance ever since that time. About twenty years ago, being again in Spain as a soldier of the "Legion," he suffered

from complete retention of urine, for the relief of which both French and Spanish surgeons endeavoured, without success, to introduce instruments. Suppuration in the perinæum then took place, and led to a fistulous opening, through which his water escaped with increasing freedom, until little of it passed through the natural channel. In this state, his life having become very uncomfortable, he applied to me. At the second or third attempt, I succeeded in passing a small bougie into the bladder, so as to make way for the grooved director, upon which I divided the stricture on the 7th of January. On the 9th, the catheter was removed. On the 13th, the urine passed in equal portions by the wound and by the urethra. On the 28th, it had entirely resumed its proper course, and the patient felt completely free from his complaint of forty-two years' duration.—*Edinburgh Med. Journal, July*, 1857, p. 1.

68.—MR. MARSHALL'S STAFF IN SYME'S OPERATION FOR STRICTURE.

As this instrument may not have fallen under the notice of many of our readers, and as it appears to combine many indications, and greatly to facilitate the performance of the operation, we propose shortly to explain the invention, and its supposed advantages over the staff in common use—that of Syme. The latter is, as our readers are aware, a solid cylindrical grooved staff, with a shoulder, the groove reaching from the extremity of the staff a very short distance on to the shoulder. Mr. Marshall's instrument consists of a staff of a peculiar form, in two pieces, which are united by a screw. The shaft, instead of being cylindrical, is flattened on its posterior surface, has a larger curve than those in ordinary use, and the groove extends further up the shaft, and ceases further from the point. The lower piece is first introduced through the stricture into the bladder: and on to the upper piece a gum catheter, of corresponding shape, is fixed, having a silver piece at the lower end, which is marked on the back, or flat portion, by a groove, which thus corresponds to the groove on the rest of the staff. This upper piece being thus screwed on to the piece in the bladder, the catheter is pushed down it until it meets with the stricture, when it is, of course, checked. In this position it is fixed by a screw at the top, and then acts as a shoulder to the staff. The stricture is then divided in the ordinary way, and this division having been effected, the catheter is pushed on. If the division have been effectually performed, it will enter the bladder; otherwise its shoulder will be again arrested at the part which requires division, when it can be again fixed by the screw, and the knife used as required. When the catheter has fairly entered the bladder it is withdrawn, and a common catheter (having the end as well as the eye open) passed over the staff into the bladder; the staff is then removed.

The advantages of this plan are: 1. That the shoulder is moveable and meets the stricture, wherever the latter may be. 2. That, from the shape of the instrument, the groove in the catheter must always correspond to that in the staff, and be in the median line posteriorly; and the catheter, with its shoulder, is perfectly steady, and does not slip about under the operator's finger. 3. That if any part of the stricture has escaped division, or if another constriction exists behind it, it is immediately discovered, and the shoulder can be at once applied to it. 4. That there can be no difficulty, after the division of the stricture, in introducing the catheter into the bladder, as the steel staff remains all the time to serve as a director. This latter is, perhaps, the most important advantage of this instrument, and one to which several other surgeons have directed their attention, and which they have endeavoured to obtain by inventions of more or less merit. These we do not intend to discuss at present, but will merely mention here, that the late Dr. Mackenzie of Edinburgh, and Mr. Haynes Walton, have proposed modifications of Syme's staff, the principle of which more or less resembles that of Mr. Marshall's instrument. These inventions, however, were never laid before the professional public; and whatever other merit is due to the ingenious apparatus devised by Mr. Marshall, that of originality must also be conceded to him.—*British Medical Journal*, *May* 2, 1857, *p.* 358.

69.—ON STRICTURE OF THE URETHRA.

By John Adams, Esq., Surgeon to the London Hospital.

[The majority of cases which come under our notice may be relieved without any other surgical interference than the introduction of the catheter.]

I dare say you are aware that there are different descriptions of stricture. Thus nosologists admit of three varieties of this complaint, namely, spasmodic, inflammatory, and permanent strictures. The first arises from a contraction of the muscular apparatus which encircles the membranous portion of the urethra, and may be illustrated in a case where retention of urine occurs in a gouty subject, and in a patient who, after drinking acid wines, &c., finds his stream of water diminishing in size, and becomes the subject of retention of urine. The second form of the disease may be readily observed in severe gonorrhœa, when the stream of urine is first reduced to the size of a thread, and afterwards stops altogether; and the third you will understand by referring to the case under consideration, and which is of most common occurrence. I must say of the first, that when the catheter is employed for the relief of retention, you should select rather a small elastic catheter, and passing it gently down to the seat of spasm, maintain your pressure for a short time, and the spasm will often yield. Failing this, and you will sometimes necessarily fail, you must order

leeches to the perinæum, a warm bath, and a dose of castor oil, with laudanum. These means will seldom fail to relieve the retention, and the patient will continue well for some time, but always liable, under similar circumstances, to a repetition of the attack. Much relief will be afforded in the after-treatment of the disease by the exhibition of liq. potassæ and tincture of hyoscyamus. If the inflammatory stricture is attended with retention of urine, a very similar treatment must be pursued. I may, however, be permitted to make the following remarks, which are applicable to retention of urine under both these conditions:—

You are called to a case of retention of urine, which has existed perhaps twenty-four hours; you find the bladder enormously distended, and the efforts to micturate frequent and most urgent; you trace the history of the case, and you come to the conclusion that the symptoms have been those of inflammatory stricture from severe gonorrhœa; and you believe that the retention results from the swollen state of the mucous membrane of the urethra, accompanied, probably, with spasm of the muscles surrounding the membranous part of the canal. Now you are not in such a case to waste any time in the employment of leeches, warm baths, &c.; but you must at once pass a catheter: a moderate-sized, or rather small elastic catheter, must be introduced carefully into the bladder, and the water drawn off. But if the case is not severe, and the retention not urgent, you may modify your practice. Put twelve leeches to the perinæum, place the patient in a warm bath, give him an ounce of castor oil and thirty drops of laudanum on it, and ten to one but he will pass his water either in the bath or when the oil operates. Indeed, I am of opinion that most cases of retention, except those arising from enlarged prostate, are capable of relief in this way, even though depending on permanent stricture; and I remember one of our house-surgeons telling me, some time ago, that he generally succeeded in such cases in this manner without the catheter, if no attempts had been made with this instrument. Even after the unsuccessful attempts at catheterization, these means will not unfrequently succeed. I have repeatedly witnessed such a result, even where false passages have been made by the forcible efforts to pass a catheter.

But I wish to direct your attention to permanent stricture of the urethra. The most common situation of this form of stricture has been variously stated to be anterior to the bulb in the spongy portion of the canal, or at the membranous part. In the case under consideration the stricture was anterior to the bulb. Of the nature of stricture I may remark that it consists, in its simplest form, of a thickening of the mucous membrane to a greater or less extent of surface, to which may be added a thickened state of the submucous fibrous tissue, and superadded to this there may be a deposition into the cells of the corpus spongiosum urethra, even accompanied by a thickening of the skin of the penis to such an extent as to encroach upon the canal. In

the case before us my opinion is, that the stricture is due to the thickening of the mucous membrane and submucous tissue, giving rise to a peculiar feeling of elasticity of the part, in consequence of which the catheter becomes firmly grasped when its point enters the stricture. The practice I have pursued in this case is exactly that which is in common use, and the principles of which I will explain. The object is to dilate the strictured part of the urethra, and the cure of the stricture is said to be by dilatation.

The subject requires some explanation. You cannot with impunity stretch living parts as you can those which are dead; for by endeavouring to do so you endanger their vitality, and a sudden overstretching of a canal is apt to do a great deal of mischief; but if you proceed cautiously you may do a great deal without injury: thus, in the employment of Mr. Wakley's instruments you may often succeed, at one sitting, in passing a fair-sized catheter over a small sound first introduced, even through a very tight stricture. In the ordinary plan of treatment by the catheter, in most inveterate strictures, the dilatation of the strictured part is accomplished by promoting the absorption of the superadded tissue by the pressure exerted by means of the catheter. Thus in a severe stricture you proceed in the following manner:—You find that you cannot get your catheter through the stricture or even into it; you therefore pass it down to the stricture and press firmly against it; it yields a little, and you get the patient to keep it in that position for some time—say for three or four hours—and then withdraw the instrument; in the course of three days, and after the use of the hip-bath, you try again, you find you have gained a little ground; and after two or three trials at intervals of three days you find that the catheter passes suddenly into the bladder.

Do not be ashamed at being foiled in passing the catheter. I have seen many lives sacrificed to the false pride of the surgeon: all museums will testify to this; and I well remember repeated post-mortems, consequent on injury the result of the surgeon's violence, in his efforts to save his credit as an invariably successful catheterizer. It is false pride; and the practice is essentially bad in principle, for, if the catheter is passed with violence, it often cannot be borne, even if it be in the right direction; but false passages, and other inconveniences, are apt to result from the violent attempts to pass the catheter. I cannot speak too strongly on this subject. Now, it will often happen that, in a very severe stricture, the instrument will readily pass at the second trial, when no apparent impression was made on the stricture at the first. You should bear in mind, also, that a stricture may be limited in its extent, as is the case in what are termed annular strictures, or there may be two or more strictures occupying various parts of the canal, or a very large portion of the urethra may be contracted to a very slender canal; and this condition is apt to result from a thickening of the mucous membrane, and the submucous fibrous tissue. The principle of treatment is the same in all, and it is to that I shall

now direct attention. However much surgeons may differ in ideas of the nature, situation, and even treatment of stricture, yet no man ventures to affirm that he can cure a stricture of the permanent class without the use of the catheter. You will have remarked that, in the case alluded to, the catheter No. 4 was first attempted to be passed unsuccessfully, and that, after a few unsuccessful attempts in the manner already noted, it slipped suddenly into the bladder.

Now, here a most important point is gained, and when you have attained this you may fairly conclude that the after-treatment is all plain and straightforward. But you will, nevertheless, meet with difficulties sometimes of rather a serious nature. Having got the catheter in, I directed it to be secured with tapes, and on no account to be removed until my next visit. I also ordered that a full opiate should be given every night if requisite, and especially if any shivering should occur. On my next visit, at an interval of three days, I found the catheter still in the passage, but instead of being firmly grasped by the urethra, as on the first introduction, I found that it was moved with the greatest facility, and it was covered with a copious mucous secretion. I therefore at once replaced it with an instrument of the next size, and gave similar directions as to its retention, and as to opiates, &c. So at my next visit I passed a larger instrument, and so on, after some time, and proceeding in the same cautious method, I was at last able to pass about a No. 8 catheter; and here I stopped, finding that the urethra did not readily dilate further. You will often find such to be the case, and therefore any attempts at further dilatation would not only be of no use, but would be positively injurious. Be content with what you have done, as an urethra capable of receiving readily a No. 8 catheter will be abundantly serviceable if you can maintain its calibre at that point; and to this your attention must now be directed. Therefore a No. 8 was passed daily in this case by the attending dresser, and when all difficulty was at an end the patient was taught to pass a catheter himself; and, being directed to use it every other day, or twice a week, he was dismissed with what I conceive to be as perfect a cure as the nature of his case admits.

I advise you to pursue this practice, and you will be successful. Be cautious in your first attempts to pass the catheter. Never mind being foiled at first. The best surgeons in the world have failed; they must fail occasionally; but their judgment is displayed better in proceeding cautiously and avoiding violence, than in being determined not to be foiled, and using such an amount of force as leads, by a series of injuries, to the eventual destruction of the patient. I remember a private patient of a late surgeon of this hospital who told me that he had obtained more relief from an advertising quack than from his regular surgeon; for, he said, "You surgeons won't have patience; you use too much violence; whereas the quack whom I consulted was exceedingly cautious in his use of instruments, and if he

found himself foiled, he immediately put me on twelve leeches to the perinæum, and gave me a warm bath in his own house; and after this he succeeded in getting in an elastic catheter easily enough." Well, this will show you the importance of a little caution in the use of instruments.

Let us now consider how a catheter acts in curing stricture. The first effect of passing a catheter through a stricture will be to stretch the urethra or dilate the canal, and often this is all that is necessary; but, too often, you will find that in the course of two days, when you attempt to re-introduce the catheter, you have the same work to do over again. If, on the contrary, you tie the catheter in, a very different state of things invariably happens; and the parts are all loosened around, in consequence of the absorption or removal of the contracting medium, and dilatation is the consequence. I believe that dilatation may occur in three ways in the cure of stricture—first, it may happen from a simple stretching of parts; secondly, it may result from absorption of tissue, in consequence of the pressure of the catheter against the stricture; and, thirdly, it may arise from a softening, or, to use a common expression, a melting down by suppuration of the indurated tissues, as a consequence of the pressure exerted on the part, and the residence of the catheter in the urethra, which, of course, is felt as a foreign body.

You must expect to meet with difficulties even in pursuing the simple practice here laid down. Thus, a patient will tell you that he cannot keep the catheter in. If this be so, your tactics must vary; but, before you make any change in your treatment, insist firmly that your plan must be carried out, and you will frequently overcome the antipathy of your patient to the use of the catheter as recommended. Give him opium, and this will often reconcile him to the inconvenience. A regular febrile attack will frequently dispose you to relinquish your treatment, and to remove the catheter. I do not know why it is, but there is no doubt that shivering and all other febrile symptoms are apt to follow or accompany irritation of the urinary organs. Still my advice to you is, not to be disconcerted by a slight febrile attack; do not alter your plan, but pursue it steadily even with this complication; give opium again, and often the fever will subside, and then you can go on uninterruptedly, as in the case before us. I will not say that there are are not cases in which it may be desirable to suspend your treatment; but I would say, do not let trifles divert you from persevering in the use of the catheter as now recommended. Of course you must expect cases in which it is necessary wholly to desist, at any rate for a time, and you may be compelled to leech the perinæum, use warm baths, and give opium largely; when, after having allayed all local and constitutional irritation, you can again resort to the means indicated.

But the obstacles against this mode of treatment which may be deemed insurmountable I shall consider at a future time. Before I conclude my remarks on the subject of catheterization, I must insist

on the importance of avoiding undue stretching of the urethra by instruments larger than necessary, and which are always injurious rather than beneficial; and let me again mention the fact, that often after passing only a very small instrument you will find to your surprise that you can readily succeed in introducing a catheter of far greater size than the one first employed, and which was introduced with the greatest difficulty. I suspect that the stricture in such cases is annular or of very limited extent, and that the passing of the catheter has broken it down at once. It will certainly happen occasionally, and I think it is in such cases as those just referred to that a single introduction of the catheter will really effect a cure, and that it may possibly never be requisite again to resort to the use of instruments; but such a desideratum is certainly most unusual, and in most cases, however much they appear to have been benefited by the catheter, it is most desirable occasionally, even at the intervals of ten or twelve months, to pass the catheter. With respect to the curability of stricture, I cannot too much insist upon the fact that few cases of stricture can ever be said to be cured, so that they shall give no further trouble or inconvenience. It is a fatal error to suppose that strictures are often cured. You will generally find on inquiry that a slow, although perhaps almost imperceptible, diminution in the size of the stream of urine goes on for a considerable time, and unless you resort again to the introduction of the catheter your patient will at the end of a year be as bad as he was before, and you will have to go over the same ground again; and hence the importance of teaching a patient to pass the catheter himself occasionally.

There is something in the nature of the newly deposited substance which constitutes stricture that has a most remarkable tendency to contract, and there are no medicinal means capable of preventing it; although it is undoubtedly accelerated and increased by anything calculated to irritate the urinary organs. Inflammation of the urethra, as in a case of severe gonorrhœa, will most certainly lead to this unfortunate result; so also stone in the bladder will give rise to the same condition,—nay, even irritation in the kidney, as from a small renal calculus, will favour the same: and hence the importance of avoiding all causes of irritation, as free drinking, &c. Nothing can be considered entirely prophylactic of this disease, save the occasional introduction of the catheter. I have, however, in more than one instance seen cases where what may be considered a spontaneous cure of stricture has occurred, if one can believe the account of the case as furnished by the patient; but this has happened where there has been a total abstinence from stimuli of every description, and the patient has led a most temperate and regular life. This must, however, be considered as an exception to a general rule; and it is not unlikely that the stricture was originally of the spasmodic rather than the permanent variety.

I do not wish you to imagine that the practice I have advised is new. It is as old as the hills, and was the only one pursued when I was a student; and I can only justify myself in directing your attention to it, because, when new remedies are advocated, the old ones are sometimes wholly put aside. Of course it will happen that some patients will not submit to the treatment which I have recommended you to pursue in permanent stricture. Indeed, a man may be so circumstanced, that he cannot lay up and pursue the regimen prescribed; and there are others who cannot really bear the catheter to be retained in the bladder. Hence some modification in the treatment becomes requisite; and the occasional passing of the catheter or the bougie, at intervals of two or three days, is the only substitute for that more efficacious system that I have endeavoured to inculcate. Indeed, in private practice this is very frequently the only method you can employ: patients will not submit to the regimen enjoined, and therefore will only pursue that which may be called the palliative plan of treatment. But even here I would advise the same precautions as in the treatment by the catheter, in respect to the use and management of instruments, the same precaution against attempting too much at once, the same precaution against overstretching the urethra by too large instruments; and, lastly, the same precautions in instructing your patient after his urethra has been fairly dilated to pass the catheter himself occasionally.—*Med. Times and Gazette, Aug.* 15, 1857, *p.* 157.

70.—THE PROBE-POINTED CATHETER FOR EXTREMELY NARROW STRICTURES.

By Henry Thompson, Esq., M.B., Assistant Surgeon to University College Hospital.

[The danger to the urethral canal is greater the smaller the instrument used, and yet even on the dead subject strictures are occasionally found so narrow that the finest probe only can be insinuated through them.]

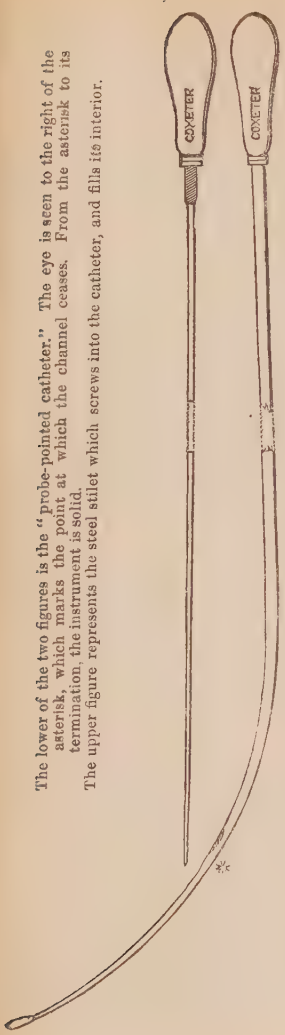
These instances are very rare. But I am inclined to believe that the secret of success *for them*, all other means failing, is to use a sufficiently small instrument. It is unquestioned, that there are some strictures so narrow that a catheter of the smallest size, slender as it is, will not pass them, nor indeed any instrument which is not some degrees smaller. Hence the employment of catgut and elastic bougies of extreme tenuity. Such are necessarily, however, very unreliable instruments, from the impossibility of commanding them in their progress along the urethra, or of even knowing where they go. At all events, that most satisfactory test of success, which should never be dispensed with when it can be employed—viz., the outflow of urine through them, is with such instruments impossible. Hence it is, then,

when requiring the smallest size of Syme's staff, I have found the advantage of employing one with a bore throughout. The appearance of the urine at its handle is the best and safest guarantee of the position of a small instrument; and *the smaller the instrument, the more necessary is the guarantee.*

In the autumn of 1855, I had a case which foiled several carefully-made attempts, aided by the means which medicine suggests in such circumstances, and which need not here be detailed. The catheters which I had long used for such cases—viz., two sizes less than No. 1, were obviously too large. The patient passed his urine only in small drops, and was wholly incapacitated by his complaint from business of any kind. I then devised an instrument, which, while it was as small, if not smaller, than any catgut bougie, was also capable of permitting the urine to flow through it. It was at the same time as strong, as firm, and as solid in the hand as any catheter of the size of No. 2 at least. In that case it was perfectly successful. I drew off the patient's urine with it, tied it in his bladder, replaced it by larger instruments, and finally cured him by dilatation. I have employed it in three similar cases since, in which I could not succeed in introducing small catheters, and in all it led the way to a cure by dilatation; that is to say, to a condition in which the patient continues free from every symptom of complaint or annoyance by occasionally passing for himself an instrument varying in size from No. 8 to No. 10.

One of these patients, to whose stricture this instrument was the key, had, after repeated failures in London, tried the resources of Paris without success, no one having before succeeded in introducing an instrument into the bladder. That gentleman now enjoys, after twenty years of suffering, excellent health, passing for himself at present a No. 9 catheter once a week.

The instrument, which is made of silver, will be seen, by reference to the subjoined engraving, to have nearly the form of a catheter. Its last two inches, however, are made perfectly solid. This extremity can therefore be made of any size or form desired, these not being limited by the necessity for a channel inside. However small it may be necessary to use an instrument in any given case, so small can this probe-pointed extremity be constructed. At about two inches and a half from the end, the channel begins, and the small eye is placed, the instrument increasing in size first to that of a No. 1, and then to nearly that of No. 2, which is continued throughout the entire shaft. Finally, the whole is strengthened by a small steel rod or stilet, which accurately fills the interior, and to which the handle is attached. The small eye cannot therefore be blocked up with mucus or other matters. Moreover, this rod screws in, and gives to the instrument the most perfect solidity. Having succeeded in passing the stricture, it is carefully insinuated a little further, when, on unscrewing the handle, the urine will issue from the external orifice, by drops only,



The lower of the two figures is the "probe-pointed catheter." The eye is seen to the right of the asterisk, which marks the point at which the channel ceases. From the asterisk to its termination, the instrument is solid.
The upper figure represents the steel stilet which screws into the catheter, and fills its interior.

it is true, on account of the smallness of the internal orifice, but in a manner which in time relieves the patient, while it assures the operator of his complete success. It may be called, "the probe-pointed catheter." It is needless to add, that the utmost care and lightness of hand are absolutely necessary in the management of so small an instrument; and any deviation from such practice is extremely hazardous. Certainly its use cannot be recommended to beginners, or to those who are not well accustomed to the use of instruments in the urethra.

I may add, that the handle *being removed with the stilet,* it is easy to screw in its place a small steel rod, and slide over it a fine gum-elastic tube, made of silk, into the bladder, if desired, after the solid instrument has been retained a few hours, thus ensuring the absence of difficulty in reaching the bladder a second time, a method of proceeding which Mr. Wakley has done much to introduce into practice. In many hands, such a plan would be the safest and most desirable. Further, the small instrument should not be retained longer than is necessary to facilitate the introduction of the second. This plan being employed for the first step, if preferred, the remaining treatment may be conducted in any manner which the circumstances of the case appear to indicate. — *Lancet, June* 20, 1857 *p.* 624.

71.—*On the Probe-Pointed Catheter for extremely Narrow Strictures.* By Dr. Wm. Murray Dobie, Chester.—[Professor Syme's opinion is probably well known that there are *no* strictures capable of allowing the passage of urine, even in drops, which cannot be permeated by skilfully-directed efforts with sufficiently small instruments.]

In cases of extremely tight stricture, Mr. Syme is in the habit of using a tapering bougie, of Berlin silver, very much attenuated towards the extremity, which is slightly probe-pointed. He discards entirely fine elastic, gum, and catgut bougies, which Mr. Thompson very correctly characterizes as "unreliable instruments." It appears to me that no substantial advantage will be gained by the employment of the new instrument described and invented by Mr. H. Thompson. The appearance of the urine, at the end of a catheter, is doubtless a satisfactory guarantee that the instrument is fairly through the stricture; but before this can take place in the new instrument, more than two inches of a thin metallic rod must be pushed *beyond* the constricted portion of the urethra. This I regard to be a fatal objection to its use. I will suppose the probe-pointed catheter to be used in a case of extremely tight stricture close to the bulb; it is evident that great mischief might be done to the dilated urethra posterior to the constriction. The thicker part of the instrument being wedged firmly in the stricture, the guidance of the terminal portion must be a matter of great uncertainty, even in the most skilful hands, and, in inexperienced hands, the consequences might be most disastrous. The probe-pointed bougie appears to me to be a much safer instrument than the probe-pointed catheter; and its use in cases of retention can always be followed up by the introduction of the smallest silver catheter, which instrument has this great advantage, that *the moment it has passed through the stricture* drops of urine begin to appear at its extremity.—*Lancet, July* 4, 1857, *p.* 19.

72.—*Use of Chloroform in Retention of Urine.*—[The patient had gonorrhœa about twelve years since, and had ever since more or less difficulty in passing his water. Retention of urine came on whilst at Guy's Hospital for some chest affection, and all attempts at passing an instrument completely failed.]

The retention had now been complete for two days, the symptoms were becoming very urgent, and Mr. Cooper Forster was accordingly called to see him. Opium had been most freely given. Having failed in persevering attempts to introduce a No. 2 catheter, Mr. Forster determined to administer chloroform, and then, if needful, to puncture the bladder by the rectum. When completely insensible, another trial was made with a No. 3, which now passed most readily. We cite

this case as important, because it proves beyond dispute the influence of the anæsthetic state in relaxing an otherwise impermeable stricture. An opiate treatment had been fairly tried before, and had failed, and the catheter had also been found useless in the hands of several well-practised surgeons. The plan of administering chloroform in cases of obstinate stricture and retention is one in wide use, both in hospital and private practice; but, as it is not yet in such general favour as it deserves to be, we have thought that so pointed an example of its advantages might be worth bringing before our readers.—*Med. Times and Gazette, June* 6, 1857, *p.* 563.

73.—*Hydrocele Photoscope.* By JOHN C. SAVERY, Esq., House-Surgeon to the Northampton General Infirmary.—I have used a darkened tube in the diagnosis of hydrocele for the last twelve months, and can recommend it as being extremely useful. That which I employ is of tin, blackened within, 7 inches long, $1\frac{1}{4}$ in diameter at its larger end, and tapering to $\frac{3}{4}$, where it is furnished with a wooden eye-piece. In sunlight, or in a tolerably translucent hydrocele, a candle can be dispensed with, as sufficient light makes its way through to reveal the nature of the swelling.—*Med. Times and Gazette, July* 11, 1857, *p.* 45.

74.—*Treatment of Hydrocele by Evacuation of the Fluid into the Cellular Tissue of the Scrotum.* By E. STANLEY, Esq., F.R.S.—A simple way of treating hydrocele, which was rapidly successful in effecting at least a temporary cure, was seen at St. Bartholomew's a short time ago in the case of a patient of Mr. Stanley's. The man had laboured for four years under the disease, and the tumour had attained a large size. He had never been under any treatment for it. The method consists merely in puncturing the swelling with a common darning needle, which is then rotated about for a few minutes, and the fluid thus allowed to escape into the cellular tissue of the scrotum. In the case before us, this took place with great facility, so as to produce rapid œdema, and the fluid was very speedily absorbed from the cellular tissue. The patient was quite well in forty-eight hours. He was kept under observation for a week, when, as the fluid showed no disposition to reaccumulate, he was discharged. The simplicity and painlessness of this method would suffice to recommend it in those numerous cases in which the patient will not submit to the cure by injections, even if it held out no prospect of a permanent cure. It is believed, however, that the more favourable result will follow in a tolerably large number of cases.—*British Medical Journal, Aug.* 8, 1857, *p.* 661.

DISEASES OF THE SKIN.

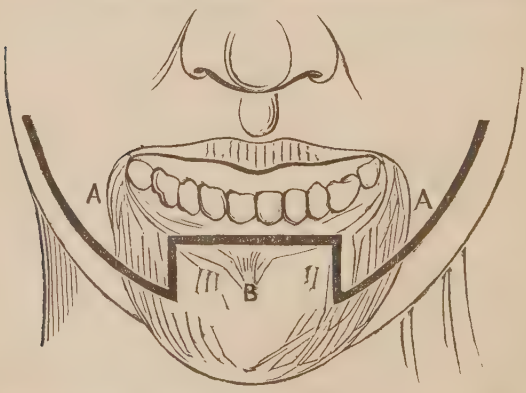
75.—ON PLASTIC OPERATIONS FOR THE RESTORATION OF THE LOWER LIP, AND FOR THE RELIEF OF SEVERAL DEFORMITIES OF THE FACE AND NECK.

By Thomas P. Teale, Esq., Surgeon to the Leeds General Infirmary

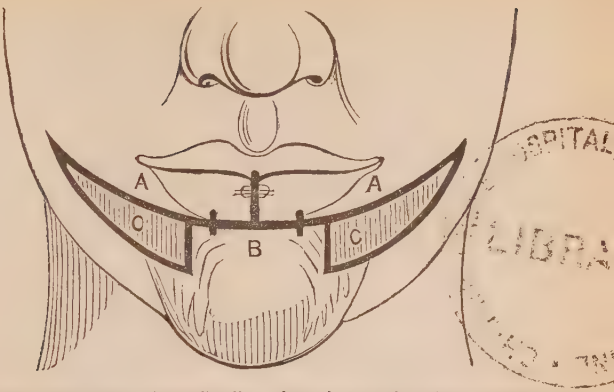
[A paper on this subject was published in the 'Transactions of the Royal Medical and Chirurgical Society' for 1855, relating three cases in which Mr. Teale had operated. The author, in the present interesting papers, details these cases more fully, together with others which have since occurred to him, illustrating each case with engravings, showing the condition of the patient before and after operation. The following is Mr. Teale's description of the operations to which the patients were subjected.]

1. *Operation for the Restoration of the Lower Lip.*—The usual cause which renders this operation necessary is the contraction following deep and extensive burns of the neck. As contraction advances, the chin becomes drawn down to the sternum; the mucous membrane of the lower lip is turned outwards, and drawn to the lower edge of the chin; the incisor teeth of the lower jaw gradually assume a horizontal direction, and are drawn much in advance of those of the upper jaw. In extreme cases the lower incisors take a direction almost horizontal. The tongue sometimes lolls out of the mouth, and the saliva is constantly dribbling away.

To relieve this sad condition the following operation is proposed:—



AA. Lateral flaps formed of everted lower lip and cheek. B. Central portion of everted lower lip.



AA. Lateral flaps united in the median line, above the central portion of everted lower lip B. CC. Exposed surfaces left to granulate.

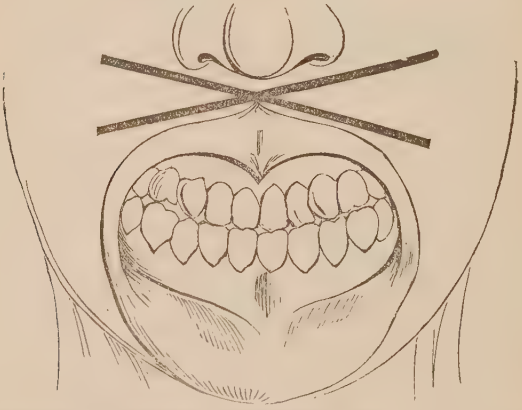
Two vertical incisions, about three-quarters of an inch in extent, are made through the everted lip down to the bone. These incisions are so placed as to divide the upper portion of the everted lip into three parts—the middle being equal to one-half of the natural breadth of the lip, while the two lateral portions are each equal to one-fourth. From the lower end of each vertical incision the knife is carried in a curving direction outwards and upwards to a point situated about one inch from the angle of the mouth opposite to the second molar tooth of the upper jaw. The two flaps thus marked out and deeply incised are then separated from the bone, the mucous membrane uniting them to the alveoli being freely divided. Lastly, a bare surface is made along the alveolar border of the middle portion of the everted lip. The incisions being now completed, the lateral flaps are drawn upwards and united by twisted sutures to each other in the median line, and to the middle portion of the everted lip at their inferior border. In this way a new lip is, as it were, built upon the middle portion of the old one.

2. *Operation for Restoration of the Upper Lip.*—The process of cicatrization sometimes reduces the upper lip to a narrow transverse band, drawn up close to the nose, leaving the upper teeth and gums exposed. This deformity interferes with the perfect closure of the mouth, and causes an unseemly aspect.

The contracted upper lip in the fifth case of the present series was restored to its natural size and function by the following operation:—

A crucial incision is made (*en sautire*), having its point of intersection immediately below the septum of the nose. Each limb of this incision is about one and a half inch in length. The two limbs on

each side diverge moderately as they pass outwards to the cheek, and enclose between them an acutely angular flap of skin and other tissues. This crucial incision is extended deeply through the entire substance of the imperfect lip and the cheeks. The parts implicated in the incisions are then freely loosed from their attachments to the superior maxillary bone by the knife being passed upwards between the bone and the remnant of lip. The parts being thus detached, the two lateral angular flaps are drawn across the median line, dovetailing with each other, and thereby increasing the depth of the lip at the expense of its breadth. In this position the flaps are retained by one pin and twisted suture.



3. *Operation for Relieving Contractions of the Neck.*—In some cases the contraction of the neck is so great that the head is bowed forwards, the chin drawn to the sternum, and the lateral movements of the neck greatly restrained. These evils may generally be much mitigated, and sometimes completely relieved by plastic surgery.

In 1839, Mr. Carden, of Worcester, operated upon a girl aged fourteen years, who was much deformed by a burn, which occurred seven years before. The movements of the head were much restricted; the mouth was permanently open; the tongue protruded; the lower incisors projected horizontally, and there was constant dribbling of saliva. A transverse incision was made throughout the entire extent of cicatrix in front of the neck. The chin was then drawn upwards, and every tense band connected with the cicatrix was divided until the head was relaxed nearly into its natural position. A flap of skin, three inches long and two and a half inches wide, was detached on each side from over the clavicle and chest. These were raised and united in front of the throat. The degree of improvement effected in this case, and tested by the lapse of four years, was highly gratifying.

Subsequently to the performance of Mr. Carden's operation, a similar proceeding was adopted in several cases, with great success, by Dr. Mütter, of Philadelphia.

I have performed this operation in seven cases since August 1848, and have witnessed it in some others by my colleagues at the Leeds Infirmary.

In all the cases which I have seen there was a marked and most satisfactory improvement in the movements of the head and neck. The displacement of the lip was also in a greater or less degree mitigated by the operation on the neck, but in several of the cases this particular deformity remained to such an extent as to render a special operation for the restoration of the lower lip subsequently necessary.

In these autoplastic operations on the neck it is of essential importance, as stated by Dr. Mütter, that the incision of the scar should extend from sound skin on one side of it to sound skin on the other, and that every band of adventitious fibrous tissue beneath the scar should be divided until the bottom of the wound discloses a loose healthy cellular tissue.

The flap to be transplanted may be taken from any neighbouring portion of the neck, shoulder, or thorax, where healthy skin can be obtained. In one case, from lack of sufficient sound skin, I was under the necessity of including cicatrised skin in the flap.

The very accurate adaptation of the flap by suture should be avoided, as great tension renders the flap liable to slough. It is, therefore, better to be content with attaching the flap at its free extremity and one of its borders, and to leave the other border loose. Much may be done afterwards by careful dressing, during the healing process, to rectify any separation of the parts.

As far as I have observed, the transplanted flap rarely unites to the edges of the wound by the "first intention." All that is usually accomplished in the first instance is an organic union of the cellular surface of the flap to the parts beneath. The more close approximation of the edges of skin is obtained during the processes of granulation and healing.

When the bands of scar are so numerous or extensive as to require more flaps of skin than one to be inserted, it is better to repeat the operation at separate times. I saw much constitutional disturbance in one case from the operation having being conducted on too large a scale in the first instance.

After the lapse of some months the transplanted portion of skin is generally found to have yielded to a process of stretching, so as to exceed considerably its original dimensions.

4. *Operation for Restoration of the Lower Eyelids.*—Eversion of the lower eyelid, its tarsal border being drawn far down the cheek, is a frequent result of contracted scars. Besides the revolting appearance caused by permanent ectropeon, the patient suffers habitually from a

low form of inflammation of the conjunctiva and cornea, in consequence of these parts having being habitually deprived of the protection of the eyelid.

The eyelid in such cases may frequently be restored to its natural position by the following operation :—

An incision is made across the cheek parallel to the displaced tarsal border, about three lines below it. The portion of skin between this incision and the edge of the tarsus is freely dissected upwards, along with the whole substance of the eyelid as far as the edge of the orbit. The eyelid thus loosened is placed in its natural position, and the chasm left thereby is filled by a piece of skin transplanted from the side of the face. This operation succeeded perfectly in the right eye of William Bradby, the subject of the fifth case. It was attempted with only partial success in both eyes of John Leach, the subject of the fourth case. The want of complete success in this instance was owing to the total absence of any portion of sound skin in the neighbourhood; on which account, I was obliged to transplant on each side a piece of cicatrix, which, having only low vitality, sloughed to a considerable extent. In two other cases, not included in this series, the operation succeeded perfectly.

5. *Restoration of the Upper Eyelids.*—From the contraction of scars of the upper eyelids and forehead, the upper lids are sometimes everted, and their tarsal border is bound firmly to the superciliary ridge.

A plastic operation similar to that for the lower lids may be practised with advantage in this deformity. In the case of John Leach, I operated on each of the upper lids, by making a transverse incision parallel to the tarsal border, at a distance of three lines above it. The substance of the eyelid was then dissected downwards and freely loosened from the edge of the orbit. The upper eyelid being thus restored to its natural position, the vacuity was filled by a piece of skin transplanted from the temple. In both eyes the operation succeeded.—*Med. Times and Gazette, June* 6, 1857, *p.* 561.

76.—*On Mr. Skey's Method of Treating the Cicatrices from Burns.* —[This case occurred at St. Bartholomew's Hospital.] The patient was a little girl (Emma B——, aged six years), the front of whose neck had been burnt some years before, and had so contracted as to produce a number of distinct bands, running from above downwards, without very great deformity. The contraction resulting from the burn was treated, whilst the girl was under the influence of chloroform, by making a number of short transverse incisions in various parts of the cicatrized tissues, which gaped as they were made. This plan Mr. Skey has found very efficacious in some eight cases, all of which had done very well. It has certainly the advantage over dissecting up portions of cicatrized skin, in that there is no danger nor

risk of sloughing—an accident which not unfrequently makes a case worse than if nothing whatever had been attempted.

On a subsequent visit, we found these transverse wounds healing well, without any appearance of contraction of the cicatrix. She lay upon a flat bed, with her head considerably lower than the shoulders, and the wounds are dressed with narrow pieces of strapping, so as to approximate the *ends* of a cut to each other—not the sides—and lengthen out the old cicatrix as much as possible.—*Lancet, Aug.* 15, 1857, *p.* 169.

77.—*On the Treatment of Cicatrices of Burns and Scalds.* By W. J. Moore, Assistant Surgeon H.E.I.C.S., formerly Senior Resident Surgeon at the Queen's Hospital, Birmingham.—[Mr. Skey, in the treatment of these cases, instead of making one long incision or dissection of the cicatrix, during the last six months has made numbers of smaller transverse cuts about its surface. Mr. Moore states:]

In the 'Provincial Medical and Surgical Journal,' July 7th, 1852, and the number previous to that date, I published articles entitled "Remarks on the Treatment of Burns and Scalds." In the latter paper, after detailing the good result which followed accidental rupture of the cicatrix of a burn, I say—

"There also seems to be no reason why the same principle should not guide the knife in cases of this description. Instead of dissecting the cicatrix, or dividing it, as is usually done, I would make an incision in different directions, and even leave small detached portions of integuments, and thus imitate what occurs when the parts are ruptured by force. Each promontory or isolated piece of integument becomes, as it were, a spring from which new matter is formed. This suggestion, however, requires to be practised ere its efficacy can be fully established, and I shall probably practise it in a case now under my treatment, and give the result to the profession."

I have now the notes of several cases in which this plan was followed by great success, but owing to my departure for India shortly afterwards, they have not yet been published.

It has therefore appeared to me, that should any merit attach to the originator of this method of treating the disfiguring cicatrix resulting from burns, such merit must of necessity be mine.—*Lancet, Aug.* 22, 1857, *p.* 206.

78.—ON THE TREATMENT OF CHRONIC ECZEMA IN CHILDREN.

By Dr. Behrend.

Dr. Behrend states that he has many cases of more or less obstinately chronic eczema brought to his polyklinik. In some of these it is found on the head and face, in others on the extremities or on the genitals, but in very few on the trunk. The ages of the children have

varied from seven months to seven years, while in a few cases even the period of puberty has been passed. These eruptions are very troublesome to both patient and practitioner, becoming obstinate and relapsing in proportion to the length of time that they have existed. A so-called crusta lactea, or an eczema of the scalp, occurring in a child of from eight to twelve months old, is easier of cure than is an eczema in a child of two years old, that itself originally was only a milk-scald. It is a well-known fact that a secretion, originally pathological, may in time become a physiological one, or that which was originally a diseased condition may become necessary for the preservation of health. Hence arose the fears of metastasis in the minds of the older writers, when called upon to treat affections attended with considerable secretion, that had long continued. They were true observers, and their care upon this point was not without grounds; and Dr. Behrend cannot agree with those who think that all mere local affections of the skin, of however long duration they may be, may be suddenly dispersed, when this is possible, with impunity. Even crusta lactea has usually arisen from a too rich and stimulating diet, and requires general as well as local treatment, and a due regulation of the diet. When the affection becomes rooted into a locality, the skin there acquires secretory functions which are not so easily arrested. If we suppress chronic eczema by mere local treatment in one spot, it will break out in another, and so on. Local means are, however, of the greatest importance, and without them, by the aid of internal means alone, we shall seldom, if ever, be able to remove old eczematous or impetiginous eruptions. Such general means, partly acting by their derivative power, and partly by the specific effects they exert on the blood, must not be neglected. The local indications are the following:—

1. The separation of the scabs or crusts. This may be best accomplished by poultices and fomentations, the former being very applicable when the eczematous spots are limited, and are not situated on the head, face, or neck, where cataplasms should not be applied. It is a good plan to previously moisten the places where the poultices are to be applied with a solution of carb. sodæ (℥ii. ad ℥viii.) When large surfaces are covered with eczematous scabs, a water dressing is much to be preferred. Thin towels or pieces of linen are soaked in a solution of subcarb. potash (℥i. ad ℥vi. or ℥viii.), and then carefully applied around the whole eczematous part. Over these dry cloths or towels are laid, and the whole covered over with oiled silk and a bandage. This dressing is renewed every two or three hours, care being taken that the outer envelopes covering the wet ones be kept constantly dry. In a few days the scabs will all have separated. Pure water will not effect the separation like the solutions of potass or soda. The soda is somewhat milder than the potass, and in sensitive subjects, having an irritated skin, should be first tried. If the scabs are placed on the face, neck, or head, the application is not suitable, as the exclusion of the external air, which is essential to its success, cannot be so well

accomplished as on the limbs. For these parts, the author therefore uses cod-liver-oil-soap liniment, made by the simple mixture of carb. pot. or carb. sod. with cod-liver oil (℥i. ad ℥i.), and with this the crusts are pencilled over night and morning, having been previously moistened with the solution of soda or potass already mentioned. After pencilling the parts with the liniment in the evening, they are covered with a silk cap, cravat, &c., to protect the bed-clothes. This is removed next morning, the parts are carefully moistened with the alkaline solution by means of a sponge or towel, and all the loose crusts are carefully removed. The liniment and the silk covering are then again applied, and so on again in the evening. This separation of the scabs is of great importance for the cure; for they are the chief cause of the constant itching and scratching, which excite new inflammation and secretion, and renewed formation of scabs. The scabs also prevent applications being made to the diseased surfaces. By their removal much has been already obtained, and we have then only to keep the inflamed surface constantly clean. For this purpose cataplasms are no longer required, but the application of the alkaline washes and the liniments must be continued. Usually after a week or a fortnight's, or sometimes only after two or three weeks' employment of this procedure, we have, in place of the scabby, itching parts, smooth, red, inflamed surfaces, which no longer itch, and are scarcely painful, but which, if left to themselves, would again produce secretion and scabs.

2. The second indication is, therefore, the removal of the inflammatory conditions of the skin. One of the best means to this end is the application of a solution of ℥j. of acetate of zinc, and the same of acetate of lead in ℥viii. of distilled water, adding to this at the time of using it an equal quantity of strong chamomile infusion. To the extremities this is applied as the water dressing already named, while, when the eczema occurs on the face, &c., either portions of rag wetted with it are applied, or the parts are moistened with it several times in the day and night. In this way the inflammation may almost always be relieved. The chief difficulty is found in old obstinate cases of eczema, when a knotty condition of the cutis is found to be present, which gives to the finger passed over the surface the idea of numerous small tubercles. The knots are formed by the loosening of the texture of the cutis, and minute exudations produced by the inflammation. Each little knot requires to be touched with the nitrate of silver, which is a very tedious process, but they are usually speedily removed. If these knots are overlooked the eczema will certainly return.

3. The third indication is the restoration of its normal activity to the skin, after having relieved or moderated the inflammation, as indicated by its increasing whiteness and dryness. How this is to be effected will depend upon circumstances, such as the constitution of the patient or the presence of complications and predispositions, which will determine whether derivatives, exutories, or alteratives should be employed, or whether, as in the scrofulous diathesis, iodine or cod-liver

oil should be had recourse to. The diet should for the most part be bland, all stimulating and luxurious food and drinks being forbidden. Meat should be sparingly employed, and various unwholesome articles of diet, such as cheese, fish, &c., should not be allowed. Free exercise in the open country air, and a residence at the seaside are especially useful. These means are further aided by applications to the skin possessed of a strengthening or tonifying effect, such as, especially alum, sulphate of zinc, sulphate of iron, the oleum cadinum, oleum Rusci, &c. If the eczematous child is at the breast, it should be weaned, or at all events its nurse should be changed, or her system regulated by appropriate diet and aperients.

The practitioner must not endeavour to obtain any hasty cure, weeks and months being required where large surfaces have become accustomed to abnormal secretions. The cure should be gradual, or bit by bit.—*Med. Times and Gazette, July* 11, 1857, *p.* 43.

79.—ON THE NATURE AND TREATMENT OF BOIL AND CARBUNCLE.

By Benjamin Travers, Jun., Esq.

[It has been, and is our rule of practice, to use free incisions in the treatment of these affections. The author considers deep cutting neither requisite nor safe—under any circumstances preferring to open them by potassa-fusa, as being less exhausting, and leaving a smaller cicatrix.]

In certain cases of cancer, and other anomalous sores, it is probable that our faith in the local efficacy of strong caustics is undergoing a revival. The operation of the pure kali in changing the face of a smooth and excavated ulcer, discharging a thin ichor, into a healing surface, is very marked.

I have known such an action to be arrested by this means, where there appeared to be no alternative to the performance of a complete excision of the part. I am now about to exhibit the decided advantage to be thus obtained in the treatment of boil and carbuncle. By the use of the pure kali, a large anthrax may be destroyed and eliminated with a rapidity and an absence of suffering wholly without precedent in cases where recourse has been had to the scalpel.

In the language of Dr. Physick, "there are three stages in this disorder. The first is premonitory. In the second, the skin has become dusky, and is perforated by pin-hole orifices, whence there is an ichorous oozing," &c. At this time our interference is an urgent necessity. The effect of a caustic is now most marked, and a succession of very severe cases during the past three years has convinced me of the truth of this statement. The formation of a large eschar being a close imitation of nature's method of opening the skin, and which she desires to effect without loss of blood, cannot be wrong, and, indeed,

experience proves that it is a safe and judicious proceeding. The pure potassa, having a bluish tint when first cast, which it derives from the iron mould into which it is run, is probably the most valuable caustic which we possess for general purposes. It is quite manageable with a little care; it does its work rapidly, if only pure and dry. It kills outright all moist animal substances with which it comes into contact. It gives a good deal of pain sometimes for the first ten minutes after its application, and sometimes the patient makes little or no complaint. If there is nothing more than uneasiness after the operation, it is a sign either that the preparation has lost its virtue, being converted into a carbonate by prolonged exposure to the vapour of the atmosphere, or it may have been inefficiently applied, or at a wrong time, and before there is any sufficient indication of the points at which the skin will first give way. Lastly, the powers of life may be so sunk that the insensibility of a protracted exhaustion is made manifest by an entire exemption from all suffering of an acute or prolonged character.

The caustic-stick may be inserted into a goose-quill by way of handle, in which state it should be preserved in a closely-stoppered phial, or it may, when wanted, be simply picked up with a pair of forceps. The operator then twists some stout paper about one end of the material, and it is ready for use. In the case of a moist or discharging surface, there is no occasion to employ any water. The solution of the caustic is sufficiently provided for by the condition of the parts concerned. When first I used this material in the treatment of boils and carbuncles, I found that the fluid slough sometimes overran the margin of the wound or eschar, and a serious excoriation followed wherever this stream had passed along the cuticle. To avoid this, a dossil of dry flocky lint should be applied upon and around the new opening, and this may be allowed to remain there for some hours with advantage. It is absorbent, and defends the wound from extraneous irritation of all kinds. When a frothy, yeast-like action is seen to commence, and the parts become very dark, it is right to desist; in other words, the effect has been produced. The patient is now directed to preserve the attitude of repose, or, at all events, to remain quietly in his chamber. If the pain be prolonged, or the subject weakly, cordials, or even a full opiate, may be given with advantage. The application having done its work, and the chemical action having ceased, the pain soon subsides, unless the anthrax be unusually deep and extensive. In this particular I can, from numerous observations, fully confirm the experience of Dr. Physick; in short, this and the early separation of the sloughs, constitute two of the strongest arguments for substituting the use of the caustic kali for the knife. Some after-pain there always will be, and that, for a few minutes, may be severe. The patient might express a wish to inhale an anæsthetic. I am not sure that this practice would be always unattended with risk in very large carbuncles occurring in old people, when situated upon the nape

of the neck, or in the occipital region ; but, in numberless other instances I am not aware of any reason why an anæsthetic should be withheld, though few probably would deem it worth while to wait for such aid, were the operator not so provided at the moment. It is unnecessary here to say more of the third stage—wherein the sloughs ar cast off and granulations make their appearance—than that these processes have acquired a progressive activity in the course of a week. A large granulating chasm upon the nape, in which I could easily place the back of my four fingers, has been more than once established after using the potassa, in the course of one week from the time of applying it, where, after using the knife, no similar condition has been achieved at the end of three or four. Of course there is uneasiness, and the appetite must be coaxed, and sleep secured by a full opiate every night if necessary. The carrot-poultice is the best that can be employed with a view to early cleaning and incarning the sore. I may here also take occasion to recommend the yellow basilicon ointment, also a solution of the chlorinated soda, as being very good applications to this class of sore at particular stages or periods of the healing process. In some bad cases, I have obtained a good result—nay, I have twice been singularly successful in the use of the caustic, where the parties had previously submitted to the old rule of practice—viz., incisions, with the worst possible consequences ; but it is expedient for me to state, in conclusion, that matters are only aggravated by applying a feeble irritant like the nitrate of silver instead of a quick consuming substance, such as the pure kali, however well-timed or advisable the operation may be in other particulars. Some years ago, before I was conversant with the nature and advantage of the plan of treatment advocated in this paper, a gentleman showed me what is called an angry boil on the side of his neck. The skin was very red and hard in its neighbourhood, and its apex was prominent, being occupied by a large bead of pus. I ruptured the pustule, and then applied the nitrate of silver to the collection with considerable freedom.

In the course of twelve hours, violent pain ensued, the surrounding skin became tense and red, indeed, almost livid, with greatly increased swelling of the surrounding tegument : in short, the tumour had now acquired the dimensions of a carbuncle. In deference to a second opinion, this tumour was deeply incised, and many weeks elapsed before the patient was finally restored. Much blood was lost by the second operation, an accident which, if it did not endanger the patient's life, at all events very much retarded the approach of convalescence.

Postscript.—The impression that the use of the caustic potass is a far safer and more scientific mode of procedure in the treatment of large and devastating carbuncle than the ordinary plan of treatment by incision, will speedily pass into strong conviction with such as are willing to be guided by the patent evidence of fact rather than the

blind guidance of hearsay teaching or the poor rules of custom and connivance. The rapidity with which enormous sloughs are cast off; the elasticity shown even in old and broken habits, at a time when the constitutional powers commonly give way irretrievably under the older method; the activity of the granulating and contracting period, are so marked, and have received such repeated confirmation within the limited range of my own personal observation, that I cannot but reiterate, as a matter of certainty, that the artificial destruction of so much skin and subjacent tissue as must, under any circumstances, die and be got rid off by the sloughing process, should always be provided for by this method, which is so close an imitation of the work of the natural surgeon.

One apology for incision I am wholly at a loss to appreciate, as I cannot understand it. It is stated that early cutting saves the structure of the common integument. The discoloured, boggy, ulcerated skin tissue must always die to a limited extent. If it be incised, it encounters no fresh provocative to early separation: its de-vitalization is already so complete, that all idea of sudden relief, such as might be entertained in the face of a simple congestion, must be abandoned. The use of a cutting instrument exerts no influence for good, either present or prospective, in parts so circumstanced. Incision is but a superadded irritation, which commonly induces further induration, and at a later time obstinate sinus and renewed sloughing. Thus much for the varied local results of these two very opposite remedies. The present risk of hemorrhage, and a sudden diminution of all the vital powers, constitute, after all, the prime objection to the scalpel, as it enforces the necessity for having recourse to a far more lenient and philosophical method, so happily suggested by the existence of a remedy, which on such occasions I do not hesitate to term invaluable. —*Lancet, June* 6, 1857, *p.* 574.

80.—*On the Diagnosis of Scabies by the Presence of the Ova of the Acarus amongst the Scales of the Epidermis.* By Dr. Gull.—Scabies often presents such difficulties in diagnosis by the eye only, that every additional microscopic aid is valuable. It is admitted not to be always an easy task to find the acarus itself; but each animal (female) lays many ova, which are readily found attached to the roughened and undermined cuticle in the neighbourhood of the vesicles. I need not say the ova are well known, but their presence as a diagnostic test of itch has been overlooked. The ova are about 1-600th of an inch in their long diameter, and in many instances the fœtal acarus can be seen within the shell.—*Lancet, July* 4, 1857, *p.* 7.

Ova of Acarus Scabiei 1-600th of an inch in long diameter.

SYPHILITIC DISEASES.

81.—ON RHEUMATIC GONORRHŒA.

By Frederick C. Skey, Esq., F.R.S., Surgeon to St. Bartholomew's Hospital.

One thing has struck me very much in gonorrhœa,—it is seldom found after twenty-five years of age; and as we go on to forty, in the myriads of out-patients seen in the wards and out-patients' department every year, we find the gonorrhœal tendency becomes more what I call "eccentric;" it diverges more from the centre of the genito-urinary surfaces. As we approach the age of forty in patients, gonorrhœa becomes longer or shorter in duration, more inclined to attack other parts, whether it be the testis, the cutaneous surface, the iris, conjunctiva, &c. I believe gonorrhœa, in fact, is a congestive or dropsical state of the urethra, a constitutional affection, a "tertium quid" of something in the system of the man more than arising from infection from the woman; but in a great many instances gonorrhœa is merely the result of mistaken treatment. You will ask me the question, however,—Is gonorrhœa dependent always on inoculation of gonorrhœal matter? or, perhaps, in other words,—Can patients acquire gonorrhœa without inoculation, as taught in books? I believe they can most clearly. I don't believe at all in inoculation of gonorrhœal matter; the question is one of great practical, every-day seriousness, as on it may often depend the peace of a family. I say the large majority of gonorrhœa patients in private practice—where one can more easily trace out the history of the attack,—the large majority occur in men who have had intercourse with women without any disease whatever of a gonorrhœal character! I am quite satisfied of this in my own mind; perfectly satisfied! I prefer, however, for your instruction to direct your attention to the books of half-a-dozen military surgeons. Any kind of irritation, even the employment of bougies, will cause a discharge from the urethra, and every experienced surgeon knows when children are violated, a discharge generally follows from the mere injury to the parts.

Behind the lines of Torres Vedras you all know the Duke of Wellington became locked up with a large army. The Duke, with his usual good sense, got up hunting-matches, horse-races, and even theatricals, to amuse his officers and men till the time should arrive for fighting. There were with that army of the Peninsula some of the best surgeons of our day,—Hennen, Guthrie, Rose, Ballingall, Evans. We had a large army then, as you know, surrounded three-fourths by the sea, one-fourth by intrenchments, the Duke himself in the middle,—an army of 50,000 men and a few women! Well, what did Evans, Rose, and Guthrie find? that they soon had gonorrhœa enough on hand

in their hospitals; but there was no mistake about it, the women of Torres Vedras were quite healthy. This fact was elicited, however, in the end—they had no doubt of it—that the catamenial discharge in one sex will produce gonorrhœa in the other. Mr. Evans was sure, also, that the ordinary secretions of the female will produce even venereal disease!

Now, I'll tell you another case, and I have repeated this case so often, almost *ad nauseam*, that I don't mind repeating it. Such cases, *ex necessitate rei*, must be very immoral, but you are all old enough to see their value surgically, and only in that point of view.

These cases, in their nature as cases in private practice, are of a very delicate character; so any student or other gentleman taking notes for publication will oblige me by using his own good discretion in not giving them any unnecessary publicity; we most have such cases or none, the true immorality being to remain in our ignorance. I wish you to observe for yourselves; don't mind the written opinions of Mr. B or Mr A, embalmed in lectures on syphilis, garnished with extracts pretended to be out of Mr. Hunter. You'll find, if you only open your eyes, there is no such thing as gonorrhœal rheumatism, though there may be rheumatic gonorrhœa. The treatment of these cases amongst scientific surgeons is entirely changed,—so is their pathology; but to the case:

A young gentleman, whom I happened to know, the only son of a clergyman, seduced a young lady. This young man was a sort of laughing stock for the other boys at College, for he had evidently never gone astray. Well, I know he had intercourse for the first time with this girl about a certain day in a certain week;—any midwifery man will tell you how certain the proofs of this may be, but we are not concerned with that now. There is the fact I want you to observe. The lady was perfectly healthy, so was this young man, yet two months after he came to me with as bad a gonorrhœa, with severe ardor urinæ, &c., as ever I saw in my life. There is the case; there are dozens exactly like it. Medical evidence I know perfectly well, is often open to criticism; a good deal depends on the character of mind of a surgeon himself. One man is brought up in an atmosphere of casuistry, another is brought up in a state where he does not believe it necessary to think. When I tell this case to some men, as I have done, they don't believe it; they say that the woman who will admit the embraces of one man will admit the embraces of any other, and this young gentleman got inoculated, &c., &c. This is fearfully absurd and a wretched libel on the opposite sex. I advise you as students not to be misled by it when you come to practise for yourself, or you will make many a home and house desolate. Read, mark, and learn what the surgeons at Torres Vedras discovered; the thing is very common in married life; be careful of your opinions; give the benefit of the doubt to the woman.—*Medical Circular, July* 29, 1857, *p.* 49.

82.—ON GLEET AND GONORRHŒA—WITH A NEW MODE OF CURE.

By Frederick C. Skey, Esq., F.R.S., Surgeon to St. Bartholomew's Hospital.

Gleet is a disease, as I see it in hospital and private practire, susceptible of very fair treatment and care, and susceptible of very erroneous treatment. Gleet is not an incurable thing, if you go the right way about it. A very common error is to push your remedies too much,—indeed, far beyond the line where they continue to be useful. I know no surgical disease so over-treated as gleet is: it is managed on what I explained to you recently, as a misapplication of the term "inflammation," and on old routine, the result of that error. Gleet has nothing to do with active inflammation. The term "congestion" of vessels comes nearer to my idea of the disease. I am perfectly satisfied that gleet is the result of a passive state of the vessels, or congestion, with effusion, rather than the result of active inflammation; in fact, there is a local remora, a want of tone; and the primary thing, depend upon it, in treating gleet or gonorrhœa is to get up this tone, to strengthen the centre of the circulation, and by no manner or means to depress this centre! All depletion, purging, antimony, &c., are calculated, I believe, to deteriorate the blood rather than to improve it, or improve the general tone of the constitution in any round-about manner. In hospitals, I have no doubt at all on this point. Some very eminent men of the present day are of opinion that the type of disease has changed of late years, and that you cannot bleed at all now in cases where it was formerly the rule to do so: this is a very broad question, but it would lead me from the subject of gleet to follow it further to-day.

What is gleet? Who shall define it, or its next-door neighbour, gonorrhœa? As I merely propose in these clinical lectures to throw out some hints—some materials for you to think about as you go through the wards—I am abrupt on purpose. Gleet is derived from local as well as constitutional causes. Nothing is more common (if we revert to the history of the disease) than for a man, after a certain lapsus with one of the other sex, to have gleety discharge; if we now add to this, as we ought, that he is dissipated and careless (as nine out of ten such men are)—if he drinks and smokes, and takes a great deal of exercise,—if he continues drinking, especially, and eating very little, and losing tone, nothing is more common, I say, than for this gleet to run on into gonorrhœa. Tell me where one begins and the other ends? You can't; I wish you could. You will say, as many young men going up to college do—that one (gleet) is a sero-purulent disease, the other (gonorrhœa) is a purulent disease. I don't believe, however, that they are two diseases at all, but one. (The effusion into the pleura in pleurisy is serous; tap it, and the next is sero-purulent:

do you call it two diseases?) Cure the gleet and you'll have no gonorrhœa—cure the gonorrhœa and you'll have no gleet!

Now, as to the practical part of the matter—a few words as to treatment. We will take a typical case, with ardor urinæ, painful erection, and all the rest of it. Nay, we will say, there is slight fever, but I deny the stereotyed "inflammation of the mucous membrane of the urethra," &c. How is it to be treated? One surgeon gives calomel and jalap, cubebs and balsam *ad infinitum*, as we see the cases in St. Bartholomew's, in the out-patients' department, literally in hundreds, calomel and jalap modulating the tune into the key of gamboge, black draught, jalap and balsam. Oh, that sorrowful black draught, "senna and what purgative drug" to purge these humours out. Calomel, jalap, gamboge, black draught—there's a catalogue black indeed! I do not here draw at all on my fancy; ask the patients themselves—their lives are nearly drenched out of them, often by persons who are not medical men at all. Then, on the second day following the first visit to the chemist, or to his apprentice, the patient is ordered to come again, and he has more purgatives, a strong seidlitz powder, blue pill, &c., perhaps to get a full action of the bowels, already exhausted; he is usually ordered also cooling medicines. Then as to diet—I look upon it as perfectly monstrous. I hold it, that gleet if let alone for ten days, will get well, especially if the man keeps up the tone of his system. Many of the patients with whom I have to do in the better walks of life have their pint of wine a day at dinner, their ordinary meat twice a day, at least, and perhaps a glass or two of ale, especially with their luncheon or supper. I am not quite sure that a glass of brandy and water is not often taken, involuntarily also to be sure, with that odious pipe of tobacco, out in the garden or up in the attic. We have these young men, sons of bankers, young barristers, rich shopkeepers' sons, &c., all living very well, but let any one of them contract a gleet—for I look on gleet as the essential disease, not gonorrhœa—then, forthwith, water gruel and water diet, with starvation, are added to the purgatives. The discharge continues, more profuse than before; at the end of three weeks, there it is still; at the end of six weeks, yes, there it is; but it is now changed—now less sero-purulent and more purulent; two and three months elapse, there is the discharge. But now the patient is ordered turpentine, or balsam, or a half-drachm of cubebs, ter in die; or copaibæ guttas, xl., with injections of the sulphas zinci, gr. iv., in an ounce of water (a sort of caustic application); or it may be, all these are changed for sulphate of copper or sulphate of alum. Now this is what I meet with every week; it is the old plan of the new books, but I believe it to be very bad treatment indeed—about the worst that rational men could adopt. I would beg of each of you, as you are getting into practice, to act honestly to your patients, and avoid antiquated routine *in a new shape.*

Now, what is gleet? You perceive I repeat the question that we

left only half answered. Well, my answer is that in gleet the exhalants of the urethra pour out an abnormal amount of fluid from a specific exciting cause, and we have—I wish you to remember the phrase—a dropsical condition, or dropsy of the urethra!

All that is written of the power of inoculating gonorrhœa or gleet comes to nothing, though books are filled with such things. What is gleet and its cure? that is the practical point—don't tell me of your gonorrheal inoculations as cures, or gonorrheal chancres. Gleet, if let alone, will probably cure itself, but by the plan of treatment I have sketched, so much in favour with patients themselves, and with those men of the spermatorrhœa-chemists' shops who delude the public, it will go on for four months or five months. I have known it to go on even longer than this—but see what you are doing, and what the scientific surgeon must avoid: you begin by destroying your patient's stamina—he is confined so many weeks to his room perhaps, if he is such a fool as to stop there—you administer purgatives, you wind up the clock, and set the liver in order, &c.; but the old purgative system is on its last legs depend upon it. How much has it to answer for?—it belonged to the school of Cullen; he it was that introduced it, but it is gone. If you had let this man with gleet alone, he would get well. Four or six grains of sulphate of zinc to an ounce of water, acting like a foreign body, has been injected into his urethra, at a time that copaibæ and cubebs have been passing out in his urine; he is weakened by purgatives. You attack him right, left, and centre with physic, and you add irritation to irritation—is that the way to cure him?

I meet cases of gleet nine and ten weeks old, ay, in dozens! they come to me with a long story of all they have been doing—purgatives, balsam, mixtures, nitrate of silver injections, &c.; now I have used all sorts of things myself, led by the old routine. I have given as much as six or eight grains of the zinc to an ounce of water, but I found that I failed by my very eagerness to effect a cure. You will cure the patient to day, so to say, but he will come back as bad as ever in a day or two again. If you use an injection of six or eight grains, as I have just specified, the vessels suddenly contract; but so sure have you "re-action" and all your old troubles back again.

This "law of reaction" is no new thing in surgery—take two boys with warts on their fingers, and some of these warts are not much different, in microscopic structure, from other warty and some cancer growths. One boy has his wart scientifically excised, or rubbed with nitrate of silver, it is gone, but in a few days it comes back again, and is almost rendered perpetual by this process of pruning and nitrate of silver stimulants. The other boy cuts off his wart, and applies a mild milky juice of a plant celebrated for these cures; I cannot give you the botanical name of the plant, some of our learned Thebans doubtless can. Well! what is the result, the milky juice cures the wart entirely and effectually. The nitrate of silver encourages it to grow! I believe that in one case the mild efficient action of the milky juice,

"papaveraceæ," or dandelionaceæ, or whatever "aceæ" you please, gradually obliterates the little vessels of the part (we know lactic acid will obliterate larger vessels). Nature works with very simple agents sometimes. In one case, I say, the mild but efficient action of the milky vegetable juice blocks up and obliterates the vessels; in the other case, the vessels recoil,—say as the iris shuts out the stimulus of too much light, or the glottis expels foreign bodies, so it is in our stimuli applied to the delicate membrane of the urethra. Our strong injections, ℥j sulph. zinci to ℥viij of water, do mischief.

The most effectual remedy for this class of cases, gleet, gonorrhœa, &c., that I know is half a grain of sulphate of zinc to an ounce of rose water. There is no "recoil" of the smaller vessels, no discomfort to the patient—he must be desired to use it five times a-day; but above everything else, keep up his system by tonics, and banish purgatives, antimony, &c.

Order your patient an eight ounce lotion of this kind, containing four grains of the sulphate, no more, and let him have, internally, the tinctura ferri or ferrocitrate of quinine, *ad libitum*—do not alter his diet, except it happen to be egregiously faulty in some way: or you may give five drops of the balsam copaibæ, but do not give it in large doses—the larger the dose the more mischief it does. Gleet or gonorrhœa is not a trifling disease, remember either of them may leave a stricture, and a stricture may lead sooner or later to the utmost misery, if not death, of your patient.

If you would "build up" power, you would cure gleet or gonorrhœa in half the time usually wasted in making it worse, that is my chief position—strengthen the centre of the circulation. I will give you a case. A young man, a farmer from Wiltshire, a highly respectable man, came up to town to a cattle show, and contracted a gonorrhœa; he was "unfaithful to his wife without being aware of it." as some one says in a play of Wycherley's or Beaumont and Fletcher's. This, in a word, was the history that one could extract from him.

He appeared quite sheepish and puzzled about it, but half suspected he had gone where he ought not. He was most excited and anxious to get well, he would not for the world the doctor or his wife in Wiltshire got a hint of it—well, I cured him in two days. If I had gone the old way about it, he would still have had it at the end of two months, with what amount of family feuds I shall not strive to imagine. Here's another case:—A young gentleman going to be married, got overtaken by the ceremony being required to be done sooner than he expected. I need not go into particulars, but he called on me with a rattling gonorrhœa one morning, and he was to be married that day in the ensuing week! what was to be done? He had gone through a pilgrimage of the old routine remedies. I gave him twelve grains ferrocitrate of quinine ter in die, and told him all would be right, but to use the mild injection most religiously. He got perfectly well in a week, and the nuptial knot was tied—this was before the

passing of the "divorce bill," but, if he had not changed his old routine treatment he certainly could not have got married.

In conclusion, I would say, avoid depletion and purgatives—don't interfere with your patient's wine or beer; as for the *primæ viæ* and all that sort of thing,—leave the liver alone, and trust with confidence to tonics and mild injections.—*Medical Circular, Sept.* 9, 1857, *p.* 121.

83.—ON CALOMEL FUMIGATION IN SYPHILIS.

By Henry Lee, Esq., Surgeon to King's College and the Lock Hospitals.

[The following are some general observations upon the kind of syphilitic disease to which mercurial treatment is applicable, and the different forms in which it may be administered. Upon these points more fixed principles of treatment are greatly wanted.]

When syphilitic matter is applied to the skin or mucous membrane, if inoculation occur, a certain amount of inflammation will follow. The character of this inflammation will vary according to circumstances, and upon it will depend the results which may subsequently be expected. The action in the inoculated part may terminate in mortification. The death of the part generally involves the destruction of the poison; they together cease to exist, and when the slough separates, an ordinary sore alone remains, requiring no specific treatment. The death of the poisoned part occurs sometimes more slowly; a molecular necrosis occurs. The infected tissue perishes bit by bit, but before one part perishes it affects another; and as each part dies without taking on that peculiar action by means of which the syphilitic poison enters the constitution, the result, so far as the system is concerned, is the same as if death of the infected part had occurred at once.

Instead of terminating in mortification, or phagedæna, the inflammation may end in suppuration. In this action each pus globule is developed from being a part of the living system into an independent cell, unconnected with the organism from which it originated. In this deciduous cell-growth morbid matters are thrown off from the living body, and the observation of a large number of cases enables me to say that this occurs with regard to the syphilitic poison. The specific inflammation which is characterised by the formation of pus, or the suppurative inflammation, is not that by which the syphilitic poison gains admission to the human system.

I have now notes of upwards of seventy cases, none of them of later date than October last, in which the secretion from the primary sores was determined by microscopic examination to be purulent, and in none of these, to my knowledge, have any secondary disease followed. I therefore conclude that a suppurating syphilitic sore is a local disease, and may be treated by local remedies.

This action may be so modified that, instead of the poison being thrown off from the surface of the affected part by suppuration, a part of it may find its way along the absorbent vessels, and its presence may be recognised at any point of its passage by its power of there producing a fresh inoculation. The secretion from the original sore will often consist of particles of various sizes, and the surface of the sore will often appear broken up with a ragged irregular outline. The poison which is carried along the absorbent vessels, is arrested at the first absorbent gland which it reaches. The absorbents appear to take up alike the poison and the elements of the tissue in which it is contained, but the glands connected with the absorbent system have the power of recognising, as it were, and of arresting the poison. An indiscriminate absorption by vessels is here rectified by a discriminative activity of the absorbent glands, and the result is, that the syphilitic poison, although it frequently reaches one set of absorbent glands, seldom or never passes on to affect another set, and consequently seldom or never by this means finds an entrance into the patient's system. This morbid process, then, which for want of a better name we call "ulcerative inflammation," is again a local disease, and does not necessarily require any mercurial treatment. The occurrence of inflammatory or suppurating bubo in no way *prevents* the patient's system from being infected with syphilis; but in that case, upon inquiry, the affection which produces the secondary disease will be found not to be that which produces the suppuration of the gland. These forms of disease may coexist, but do not, except from some exceptional cause, result from the same infection.

In the three classes of local syphilitic disease which I have now very briefly described, I do not mean to say that constitutional treatment may not be necessary. In particular cases it may be advisable to have recourse to mercurial remedies, so as to affect the patient's system, but I do say that, as a rule, mercury in these three classes of cases is not required for the purpose of preventing secondary symptoms.

The morbid process by which the syphilitic poison enters the human constitution consists in a circumscribed, persistent, indolent action, partaking of the nature of the adhesive inflammation. This affection usually commences as a crack, an abrasion, or a pimple. It is accompanied by little pain, redness, or swelling, unless artificially irritated. The secretion from its surface is small in quantity, consisting often of broken-up epithelial scales; sometimes of globules having various forms, and being often opaque. Occasionally, these globules, especially when derived from a mucous surface, resemble pus-cells; they may, however, be distinguished by the addition of a little acetic acid, and subsequent microscopic examination. If the secretion from any doubtful sore be treated in this manner, if purulent, the situation of each pus-globule will contain within its circumference, one, two, or three little nuclei; if not purulent, such an appearance will not be observed. The sores which I am now describing, never, I believe, except from accidental

causes, secrete pus. The nature of the accompanying inflammation is essentially of the adhesive kind, and consequently the base and edges of the sores will generally (although not always) become infiltrated with lymph, which is deposited in a very peculiar way. It will ordinarily be so arranged as to form a layer of equal thickness, surrounding the sore on every side, and the induration which it causes will generally terminate quite abruptly, so as to give to the fingers the sensation as if a piece of thin cartilage had been let into the healthy tissues. The absorbent glands in such a case will be generally enlarged, but not inflamed; they may be felt to roll freely and without pain under the finger, and the skin covering them will be quite unaffected. These glands do not suppurate except from accidental causes, in no way necessarily associated with the disease. When a circumscribed, persistent spot of adhesive inflammation, such as those now described, appears on a suspicious part, and remains without evident cause in an indolent condition, changing little from day to day, there is the greatest danger that the patient will be affected with constitutional syphilis. These are called infecting sores—infecting as regards the patient's constitution, though not more infecting than other kinds of syphilitic sores, as regards their liability to be communicated by inoculation.

Now as the first three classes of cases—namely, those in which the inflammation terminates respectively in sloughing, in suppuration, or in ulceration—may, as a rule, be treated by local means, so the last, or that in which the accompanying inflammation is of the adhesive character, requires constitutional treatment if we would prevent our patients from having secondary symptoms. A great variety of plans have been at various times recommended for preventing the occurrence of these secondary symptoms, and for curing them when they have appeared. Some surgeons have written works in order to prove that syphilis might be cured by sarsaparilla; others have advocated opium equally strongly. Again, while some have advised the use of ammonia, others have recommended the nitro-muriatic acid. In like manner, guaiacum, China root, mezereon, bark, hemlock, sassafras, juniper, saponaria, dulcamara, the green husk of the walnut, and many other vegetable and mineral products have enjoyed a temporary reputation for the prevention or the cure of syphilis. Of late years the iodide of potassium has been in great repute, and in certain secondary forms of the disease has proved a most valuable remedy. But with regard to primary syphilis, you will now be prepared to ask what kind of affections were treated by the different medicines above-mentioned? Were their virtues tried in cases of infecting, or of non-infecting primary sores? If no discrimination has been made in this respect, it may be inferred that a large proportion of the cases treated consisted of non-infecting sores, and under these circumstances it is no wonder, in due course of time, that the primary affections healed, and were not, in a considerable proportion of cases, followed by secondary symptoms. But let a given number of cases, bearing the diagnostic marks of infecting

sores above-mentioned, be treated by any of these remedies, and I will venture to affirm that the result will be most unsatisfactory. In fact, we find that all the remedies which I have mentioned, with the exception of the iodide of potassium, after having had a temporary reputation, have fallen into comparative disuse. Mercury alone, through good and evil report, in spite of the strong prejudices of some against its use, and the no less adverse influence of others, who have used it to an unjustifiable extent, has maintained its general reputation. From within a short time of the recognition of syphilis as a specific disease, to the present, mercury has been extensively employed in its treatment, and during the whole of that time, the majority of surgeons have regarded it as the most efficacious of all known remedies. It must be admitted that mercury has often been injudiciously given, and that it has consequently done much harm. It has, nevertheless, maintained its reputation, and it may be safely affirmed, that general experience has proved that there is no remedy which has the same power to extinguish the venereal disease as mercury. The iodide of potassium, of which I have before spoken, possesses in an eminent degree the power of removing certain forms of secondary symptoms; but according to my experience, it does not permanently cure the disease in the same way that mercury does.

There are different ways of administering mercury. It may be given internally in pills; it may be used in the form of ointment; or it may be used in the form of vapour applied to the skin.

It is not necessary for me at present to enumerate the various preparations of mercury that have been administered internally. They have in common this disadvantage in the treatment of syphilis, that they disturb and irritate the digestive organs, and can seldom be continued sufficiently long satisfactorily to cure the disease.

Mercurial inunction is a very efficient way of using mercury; but it is dirty, laborious, and often little suited to the tastes of those who require its use. It is, however, much less liable to gripe and purge than when the mercury is given internally; and it does not weaken the patient's constitution nearly so much.

There are two principal objects in view in treating a case of syphilis: the first, to remove the symptoms; the second, to cure the disease. Now, a short course of mercury will often effect the former of these objects, as will also, in secondary cases, the administration of the iodide of potassium; but neither the short course of mercury, nor the iodide of potassium, will in general cure syphilis. The symptoms will, it is true, be removed, but they will return; and, practically, it is found extremely difficult to induce patients, in the upper classes of society, to continue a course of mercurial inunction sufficiently long to prevent the occurrence, or the return of secondary symptoms.

Of all the modes of treatment by mercury, none, according to my experience, removes the symptoms so readily as fumigation; none is attended with so little mischief to the patient's constitution; and after none is a relapse so seldom experienced.

The plan itself is not new. It was used in Europe soon after the recognition of the venereal disease at the end of the fifteenth century; and it was subsequently very extensively practised in India and elsewhere. The cumbrous nature of the apparatus, and the want of precise knowledge of the nature of the substances employed, has, even up to the present time, prevented this mode of treatment from coming into general use. Recently, however, the plan of using mercurial fumigations has been much improved. We are indebted to Mr. Langston Parker for having much simplified the apparatus which, at various intervals, was used by Lalouette, Pearson, Abernethy, and others. Mr. Parker recommends that from one to three drachms of the bisulphuret of mercury, or the same quantity of the grey oxide, or of the binoxide, should be used on each occasion. Now, practically, I have found some serious objections to these preparations. The bisulphuret of mercury, when exposed to heat, gives off some vapour, probably sulphurous acid gas, which causes much irritation when inhaled; and and I have reason to believe, that the symptoms produced by this preparation have been amongst the reasons why mercurial fumigation has not been more extensively practised. The grey oxide again, is found to be of uncertain composition, and as obtained at the shops it will often not volatilize at the temperature produced by an ordinary spirit-lamp. When it does volatilize, it is decomposed. It is first converted partially, or entirely, into the deutoxide of mercury, and if the temperature be increased, the oxygen is driven off, and finally the metallic mercury is sublimed. The uncertainty of the composition of this preparation, both before and after it is exposed to heat, naturally implies that its effects will be uncertain; and such, in practice, they have been found to be. Sometimes very little mercurial action has been produced; and, occasionally, the action has been excessive.

The preparation which I have, for the last eighteen months, constantly used, is calomel. It possesses the advantage of being easily sublimed at a temperature which may be commanded in any private house. It is not decomposed either by heat or vapour water, and a comparatively very small quantity is sufficient to produce all the effect that is required. Since this plan has been introduced, different simple forms of apparatus have been devised for the purpose of volatilizing the calomel, and of effectually retaining it in contact with the skin during the requisite period for absorption to take place. Mr. Matthews, of Portugal-street, has constructed two little lamps which answer the purpose very well. Over one lamp from ten to twenty grains of calomel is placed on a tin plate; and over the other there is a little water. The calomel and the water then volatilize together; and I have found, practically, that the mercurial action is more certainly produced, and more steadily maintained, when mixed with a certain quantity of vapour of water than when the calomel is used alone.

The best apparatus for calomel fumigation hitherto made is, I believe, that of Messrs. Savigny and Co., of St. James's-street. This

has been completed after many trials undertaken at the suggestion of Mr. Pollock, of St. George's Hospital. It consists of a kind of tin case, containing a spirit-lamp. In the centre, immediately over the wick of the lamp, is a small circular tin plate, upon which the ten or twenty grains of calomel are placed. Around this is a circular depression, which is half filled with boiling water. The patient places this on the ground, and sits over it, or near it, on a small cane stool. He is then enveloped, lamp and all, in a circular Mackintosh, which Messrs. Savigny have made for the purpose. When a Mackintosh cannot readily be procured, a double blanket answers the purpose very well. At the expiration of a quarter of an hour or twenty minutes, the calomel, the water, and the spirit in the lamp, will have disappeared, and the patient may then get into bed. It is well that a certain portion of the vapour should be inhaled during the bath. This will render the mercurial action more evident upon the patient's gums; but this is not always necessary for the cure of the disease. The length of time that the use of the baths should be continued, is probably about the same as would be required in other forms of mercurial treatment.

During the last eighteen months, I have employed this plan of treatment very extensively at the Lock Hospital, and there we seldom fail to get the patients' gums slightly affected in three or four days. The mercurial action may be regulated with the greatest nicety, either by the length of time the patient is exposed to the vapour of calomel, or by the quantity inhaled, or by the quantity used upon each occasion. It is never requisite to produce salivation, and in the form now recommended any excessive mercurial action can scarcely be accidentally induced. The patients' constitutions are found, at the end of the mercurial course, to be in general as strong, and often much stronger, than when they commenced.

The conclusions which I would draw from the foregoing observations are, that in primary syphilis a large proportion of cases will not require any mercurial treatment at all; and that those which do may with tolerable certainty be distinguished from those which do not; that in those cases of primary syphilis which, if left to themselves, will infect the patient's system, mercurial treatment alone can be relied upon for preventing secondary symptoms; that in cases of secondary affections, although other medicines may remove the symptoms, mercury is much more effective than any other remedy in curing the disease so that the symptoms will not recur; and that of all the modes of administering mercury, mercurial fumigation is that which is attended with the least demand upon the powers of the patient's constitution; it is that which is regulated with the greatest facility, and that which can be maintained without inconvenience for the longest period; and, I may add, that I believe it to be less frequently followed by a recurrence of secondary symptoms than any other mode of treatment whatever.—*Lancet, May* 23, 1857, *p.* 519.

84.—*Cure of Syphilis without Mercury.*—It is our duty at all times fairly and impartially to present the various modes employed in our large hospitals in the treatment of various diseases, however wedded we may be, in common with others, to certain lines of practice. There are very few at the present day who would undertake to treat syphilis without the administration of mercury in some of its forms. Many surgeons would hesitate before they would even try the effects of other remedies. The preparations of gold, which are found in the French codex, are used, in place of mercury, in inveterate forms of syphilis, in France, and, we believe, elsewhere. However, on a recent visit to the syphilitic ward of the Royal Free Hospital, where a number and variety of cases of syphilitic disease are to be met with, especially of the secondary eruptions, we find they are treated by the administration of stomachic and tonic remedies and good diet, conjoined with the following formula—viz., sulphur, one drachm; sulphuret of antimony and nitrate of potass, of each five grains; mixed into a powder, half of which is given night and morning, and persevered in till the eruption disappears, the health is improved, and a cure estatablished. Dr. Marsden has employed this mode of treatment for twenty-seven years, in thousands of cases, and he observes, that not one in a hundred instances has he known to return with constitutional symptoms. In the primary forms of syphilis he trusts to stomachics solely, with good diet. This is a very interesting and highly important fact in the treatment of syphilis. The cases of secondary eruptions under this plan of treatment, which we saw on the 1st of June, fairly spoke for themselves, as they were gradually dying away.—*Lancet, June* 27, 1857, *p.* 650.

85.—*On the Treatment of Chancre by Acetic Acid.* By Dr. Collmann.—Dr. Collmann having seen, more than two years since, an account of the successful and rapid treatment of chancre by means of acetic acid, commenced its employment, and reports that in some fifty cases of primary sore in which he has employed it, it has remarkably fulfilled the expectations held out. In recent chancre, indeed, he regards it as a true panacea, while in neglected indurated chancre it hastens the healing process materially.

In recent chancre he at once cauterizes the sore with pure acetic acid, applying it by means of a glass tube thoroughly to the part, and preventing its diffusing itself around by means of charpie. The pain caused is great, and may, in the sensitive, cause fainting. A whitish spot is the immediate result, and cold water dressing is applied. On the third day, at latest, a gangrenous eschar separates, exhibiting a very clear surface, which will heal by common dressing, but to which the author, for the purpose of encouraging suppuration, often applies night and morning a little ointment, composed of ung. basilic, ℥i., hyd. præcip. rub. gr. v., cleaning the sore with camomile infusion. By

the tenth day at latest, and often before. the sore is quite healed. On the first and third day an active purgative is administered. Until the sore has healed the diet should in general be spare, although some patients have required full diet and wine. In fine weather the patient need not be confined to the house. When after the fall of the eschar the sore is found not to be clean, the acid should be again applied, and may even have to be repeated a third time. The cicatrix that results is soft, or speedily becomes so under the employment of camomile fomentations. The author, as yet, has met with no example of bubo among his cases; nor has he observed any secondary symptoms, although he has in several instances treated the same patient twice for chancre, and in one instance five times. When the chancre has been neglected, and has become indurated, if the sore be still open it must be cauterized in the same way; but in such cases mercury or iodine should also be given. The sore often heals with remarkable promptitude.—*Deutsche Klinik, and Medical Times and Gazette, Aug.* 1, 1857, *p.* 123.

DISEASES OF THE EYE AND EAR.

86.—SYNOPSIS OF THE TREATMENT OF PURULENT OPHTHALMIA IN USE AT GUY'S HOSPITAL.

By John F. France, Esq., Surgeon to the Eye Infirmary, Guy's Hospital.

During the acute stage:—

1. Local depletion by leeching the lids, and scarifying their inner surface, every twenty-four hours.

2. Division of the external canthus, and puncturation of the integuments of the lids (as in erysipelas), when the tension and inflammatory swelling are extreme and prevent exposure of the globes.

3. Scarification of the ocular conjunctiva, according to Tyrrell's mode in radii, daily, so long as chemosis is high.

4. Application between the lids, every three, four, or six hours, of drops of a solution of its nitrate of silver, containing from three to eight grains in the ounce of distilled water; the strength of this collyrium and frequency of its use depending on the severity of the symptoms, and being, consequently, modified as these abate.

5. Constant fomentation and ablution with decoction of poppies having a drachm of alum dissolved in the pint.

6. Exhibition of mercury, after proper relief of the bowels, (croton oil is the most eligible aperient, when one is required, as the rapidity of its effect occasions the least possible delay in commencing the mercurial) until the chemosis is subdued, or the mouth affords the earliest signs of the action of the mineral. This remedy must be guardedly used, when the stage of active interstitial effusion, marked by rising

chemosis, has given way to that of ulceration manifested on the cornea. It should then be accompanied by a tonic regimen, and by—

7. Use of quinine, in cases where debility prevails at the outset, or is subsequently induced.

8. Moderately nutritious diet, which is generally preferable from the commencement, and may be progressively improved as the disease recedes.

In the convalescent or chronic stage,—

9. Tonics in diet and regimen, varied local astringents of mild character, and counter-irritants must be used to complete the cure.—*Guy's Hospital Reports, Vol. III.*, 1857, *p.* 192.

87.—ON STRUMOUS OPHTHALMIA.

By Dr. HENLEY THORP, Letterkenny.

Scrofulous ophthalmia, or pustular and phlyctenular diseases of the conjunctiva and cornea, attended with photophobia (complicated ophthalmic hyperæsthesia), present themselves under the following conditions:—

1. As a subacute affection in children sometimes otherwise apparently healthy.

2. In a more chronic form in young persons of a decidedly strumous habit.

3. As a relapsing disease in patients who have been the subjects of one or more previous attacks.

4. As occurring intercurrently during the progress of other strumous disorders.

5. In connexion with impetiginous and eczematous eruptions of the scalp and face, or of the surface generally.

Although strumous ophthalmia presents much diversity in its mode of attack, the great majority of cases will be found to arrange themselves under one or other of the five forms just indicated; I could, therefore, most conveniently, and perhaps advantageously, discuss its treatment under corresponding heads, but, in order to illustrate more fully the views I entertain respecting ophthalmic hyperæsthesia, I shall venture to arrange my practical observations with reference especially to this lesion, and in accordance with the description I have given of its three varieties.

That form of photophobia first referred to, and which is the expression of scrofulous irritation of the optic nerve and retina (optic hyperæsthesia), is the earliest symptom of a considerable number of cases of phlyctenular ophthalmia. It can often be recognised for many days before the true inflammatory phenomena present themselves; and I am certain that, by proper management, the accession of the latter can often be completely prevented. When, therefore, intolerance of light is first observed in a child of strumous habit, and is attended with the precursory symptoms of gastric derangement

already mentioned, more especially if the patient has been already a sufferer from previous attacks, let the treatment be commenced at once; here active depletion is contra-indicated, the aspect of the case forbids it, and the sooner the child is prepared for the exhibition of tonics, the better; and with this view (preceded, in some cases, by a gentle emetic) the greatest benefit will be derived from a combination of gray powder, rhubarb, and dried soda, exhibited at bedtime, and a mild, bitter infusion, with sulphate of potash, on the following morning. After these medicines have been a few times repeated, the tongue will be found cleaner, and the digestive organs much improved; and now the remedy most deserving of trial is quina,—it fully merits all the praise Mackenzie has bestowed upon it: I know of no tonic, in the treatment of strumous ophthalmia, of greater value or more general application: under its use the appetite improves, the bodily vigour is increased, and the intolerance of light diminishes or disappears; nor is it necessary to postpone its use until the tongue becomes quite clean. In cases where the digestive organs continue rebellious, and at the same time tonics are indicated by the general condition of the patient, the quina may be commenced before the alterative or aperient medicines are dispensed with, or it may be advantageously combined with them. But the value of various *adjuvantia* must not be lost sight of: a large, airy sleeping apartment, sufficient exercise in the open air, and a simple but nutritious diet, are matters of no mean importance. In winter, the temperature of the body must be maintained by flannel next the skin, and, in summer, the shower or plunge bath may be employed; at this season, also, the hair should be worn rather short, and the head kept cool. I cannot say that I have derived much benefit from local treatment in this first form of ophthalmic hyperæsthesia: light and pure air are the best topical remedies, and the child should be freely exposed to their influence. I feel assured that a steady perseverance in this plan of treatment will generally succeed in checking the disease in its simple form, and avert the consecutive affection of the conjunctiva and cornea. When these structures are attacked, the primary lesion of the optic nerve and retina is complicated, and the case becomes one of compound hyperæsthesia, or strumous ophthalmia, in the ordinary acceptation of the term. But, as previously observed, the advent of this disease is sometimes sudden and acute; there may be, from the commencement, much of general febrile disturbance and local erethism, with a quickened circulation and flushed face, and the early conjunctival injection be attended with considerable photophobia and lachrymation. Such attacks are frequently brought on by repletion with crude and indigestible food. Here, the clear indication is to empty the stomach in the first instance, and the prompt exhibition of an emetic is imperatively called for: a few grains of calomel and James' powder should be given at bed-time, and the pediluvium or warm bath also employed, so as to promote the action of the skin, and, on the following morning, it is desirable that the

bowels should be adequately freed by the infusion of senna and sulphate of potash; topical bleeding is sometimes required, and it may be necessary to apply a few leeches to the temples, according to the age of the patient, or the acute character of the local symptoms, but the early use of stimulating eye-drops is most decidedly objectionable. I have known the greatest mischief result from their indiscriminate and premature employment: the practice is certain to accelerate the development, or increase the number, of the phlyctenulæ or ulcers, and aggravate all the symptoms. The appropriate applications are of an anodyne or sedative nature, and can be used either in the form of fomentation or vapour. Let a drachm of either of the extracts of belladonna or conium be dissolved in a pint of water, and filtered through lint; to a wineglassful of this solution hot water may be added at any time, in quantity sufficient to make the whole of a suitable temperature for either steaming or fomenting the eyes; one or other of which processes should be put in practice at least two or three times in the twenty-four hours. At this stage the child must be confined to the house, and the purgative medicines repeated until the bowels have been moderately but sufficiently acted upon, when a most excellent alterative and tonic remedy will be found in a combination of sulphate of quina, gray powder, and dried soda: after some time it may be judicious to omit the mercurial, and give the quina alone, and in larger doses. In some of these cases, also, much benefit will be derived from the well-known combination of Huxham's tincture of bark with bichloride of mercury, as recommended by Sir A. Cooper. Counter-irritation is a powerful resource, and ought to be employed as soon as the more acute symptoms have subsided, or about the same time that the tonic medicines are commenced. For this purpose blisters are commonly had recourse to, but details as to their size and management are not always sufficiently regarded; the regions behind the ears and the back of the neck are usually selected, but the top of the head, over the anterior fontanelle, is also a very eligible locality; the blister on the back of the neck should be full-sized, and, in tedious cases, it may be necessary to reapply the vesicants, or keep the surface raw with Albespeyre's paper; but the salutary effects of persistent irritation, confined to one point, is doubtful, and the situation of the blister should be changed from time to time, in cases requiring prolonged counter-irritation. This is a precept of much importance, the validity of which I have often tested. Notwithstanding the best care, however, and the most judicious employment of remedies, both local and constitutional, scrofulous ophthalmia sometimes advances; phlyctenulæ form and burst; ulcerations occur in and around the cornea, and threaten to penetrate the membrane; its substance becomes the seat of interstitial abscess, or, through the diffused haziness which dims its structure, we discern the yellow semilunar streak of incipient hypopyon; the disease is present in its most destructive form, and the eye is in imminent danger.

Now, the most advantage will be derived from the adoption of the following system of treatment: calomel or gray powder, with quina and extract of conium; the application of a blister to one or other of the situations already indicated; leeches, which are occasionally required to relieve congestion, or, in some cases, scarification of the lids may be practised, as a very effectual mode of emptying the vessels; the application of nitrate of silver, and the use of the belladonna or hemlock fomentations, as before spoken of, are the means indicated by a just appreciation of the complex nature of the case. Now, in cases such as we are considering, every one is aware of the great difficulty of obtaining a satisfactory view of the eye, owing to the rigidly contracted state of the orbicularis palpebrarum, and instances are known of the ulcerated and weakened corneal structure having given way during rude attempts to overcome the action of the muscle; nevertheless, the object—which is certainly one of paramount importance—can be attained, I am happy to say, without great difficulty or danger, and for some years past I have been in the habit of resorting to the anæsthetic effects of chloroform for the purpose, and can recommend this agent as a most valuable expedient in all cases of intractable photophobia. Under its influence the orbicularis is relaxed, and the eye can be inspected in the most satisfactory manner; and, if necessary, a finely-pointed stick of nitrate of silver, or, which is preferable, a camel-hair brush, carrying a caustic solution of the salt, can be applied with perfect safety to the minutest ulcer. Moreover, I am satisfied that the chloroform exerts a beneficial influence on the disease, by diminishing pain and intolerance of light, and tranquillizing the patient.* As to the proposal of diminishing tension of the cornea by discharging the aqueous humour, and so anticipating, by artificial means, a result which the ulcerative process, if unchecked, is certain to accomplish, not having performed the operation, I can pronounce no opinion on its efficacy. In principle the practice appears sound, but, unless chloroform were employed, must be attended with much difficulty and hazard. As the effects of mercury on the gums of young persons cannot be calculated upon as a test of its curative action, the medicine must generally be continued either until the disease yields, or the cornea is perforated. When this casualty occurs, the treatment has failed, and no further good can be expected from mercurials; these latter must also be immediately suspended should the cornea at any time show a tendency to slough; on the occurrence of this process, our chief reliance must be placed on bark. The question of the influence of light, in these acute cases, is easily disposed of: its effects are pernicious, because too powerful for the highly irritable and inflamed state of the organ, just upon the principle that irritants generally are

* This application of chloroform is not mentioned in any of the standard works on ophthalmic surgery, nor is it alluded to, so far as I am aware, in any of the recently published lectures or memoirs on the subject. Although I am satisfied that so obvious a use of this valuable agent cannot have escaped the notice of others, I believe I am the first to put it on record.

injurious under states of active congestion: not that it should be altogether excluded, but the apartment ought to be kept moderately dark, and the eyes, moreover, protected by a shade; in fact, we should endeavour to moderate and adjust the stimulus to the altered sensibility of the organ, by admitting more or less light, just as the eye can tolerate its influence; the child will, consequently, be able to move about, gently exercise his vision, and subdue or resist that involuntary and almost spastic contraction of the orbicularis, which, when once confirmed, is so difficult to overcome.

It is a fortunate circumstance, considering the great frequency of strumous inflammation of the eye in these countries, that the resources of art, when promptly and judiciously employed, are generally adequate to avert the disastrous results which the disease, if unchecked in its acute stage, is almost certain to produce; nevertheless, the affection frequently continues, in a chronic or subdued form, for an indefinite period; in one class of cases, by far the most common, yielding occasionally, or remitting in its symptoms, perplexing both patient and practitioner by frequent relapses; or, in another and a rarer type, preserving a steady and unchangeable chronicity, not less remarkable than pertinacious, in which all action, whether healthy or unhealthy, appears suspended; ulcerations, if present, neither deepen nor fill up; the fasciculated vascularity is stationary, or but a few scattered vessels slowly extend themselves over the surface of the cornea. Now it is the former class of cases—the remitting—that so often affords the clearest demonstration of the influence the exalted sensibility of the nerves exerts upon the secondary objective phenomena. Diminution of photophobia is the surest precursory sign of a salutary change; its return or increase is a no less certain harbinger of evil. Immediately that the spasm of the lids, the gush of tears, and sneezing upon exposure of the eye to light, cease, the reparative actions commence.

Few diseases more severely tax the ingenuity of the surgeon, or oftener exhaust the expedients of science in new and untried combinations, than chronic phlyctenular ophthalmia. Allusion has been already made to the efficacy of bark and quina; the other remedies deserving of notice are the various preparations of iron, and particularly the syrup of the iodide, the saccharated carbonate, and the citrate of iron with quina. The muriate of baryta is an alterative of much power; and cod-liver oil may be given in this, as in allied disorders, with the greatest benefit. When I prescribe the muriate of baryta, I usually combine it with the tincture of sesquichloride of iron, which I believe enhances the value of both medicines. The citrate of quina and iron is often advantageously given, with the tincture of henbane or conium. And here I may observe that, practically, a marked difference exists between the two varieties of chronic ophthalmia just referred to, and that in our selection of remedies we should be influenced by a diagnosis of the relapsing or remitting from the more steady

or persistent type. Although, beyond doubt, patients will derive benefit from tonics and alteratives, however indiscriminately exhibited, still I am satisfied that the greatest amount of good will be obtained by paying attention to this point, and treating cases coming under the first division upon a purely tonic plan, reserving those medicines that are called alteratives for the other class of cases. It may further be noticed, that, in the remitting type, quina agrees best with the patient during the period that the symptoms assume characters of increased severity, either alone or combined with the extract of conium, and steel medicines in the intervals, when cod-liver oil also is most opportunely exhibited, the stomach being better able to retain and digest it than when the exacerbations are present, and the digestive organs likely to be in an irritable condition. But in the less frequent examples of the disease, when the symptoms are not observed to change so distinctly from time to time in their severity, but to pursue a course of greater steadiness and constancy, the bichloride of mercury, or the muriate of baryta,—the former dissolved in the compound tincture of bark, and the latter with the tincture of sesquichloride of iron,—are the combinations which, in my experience, are best deserving of trial.

[Arsenic is of great efficacy as a tonic in scrofulous diseases, thus it may be used with advantage in intractable cases of strumous ophthalmia, even though no affection of the skin exists, and for this purpose it may be combined with cod-liver-oil, iron, or bark.]

Local applications come to be auxiliaries of much importance, and, of all collyria, solutions of nitrate of silver are the most generally useful, to which small quantities of wine of opium, tincture of belladonna, or tincture of conium, may often be advantageously added when a sedative action is required; but the long-continued use of the nitrate is objectionable, from its well-known property of discolouring the conjunctiva, and therefore, solutions of other salts, as the sulphate and acetate of zinc, the bichloride of mercury, hydriodate of potash, &c., are occasionally preferable. Wine of opium is an application much used; it is too stimulating in its undiluted state, and should be mixed with equal quantities of laurel or distilled water; but as a remedy against intolerance of light few agents will bear a comparison with prussic acid; Scheele's preparation, reduced to half its strength by the addition of distilled water, or mixed with wine of opium, and dropped in the eye, will sometimes exert a really magical influence.

On the subject of counter-irritation I have little to add, further than to recommend a substance which is not very generally used for this purpose in ophthalmic surgery: I allude to iodine, a strong solution or tincture of which, applied to the outside of the upper lid,*

* The application of this solution to the lower eyelid is useless, as the iodine is quickly washed away by the copious lachrymation. There is also some risk of the tears dissolving the iodine and flowing back on the surface of the eyeball: for obvious reasons the coating of the upper lid cannot be displaced in this manner. The following is the solution which I employ:—Iodine, 1 drachm; hydriodate of potash, 1 drachm; compound tincture of iodine, 1 ounce.—Dissolve.

acts as an admirable counter-irritant. Caution, however, is requisite in its employment, to prevent its too energetic action, or any portion entering the palpebral fissure; it should be laid on carefully and *thinly* with a camel-hair brush, and by allowing time for two or three coats to dry in succession, a layer of sufficient thickness may be given to the thin integument. The application produces much pain, which continues for several minutes, and is often followed by some œdematous swelling; this, however, soon subsides, when the cuticle presents a shrivelled, dry, and yellowish appearance, but with the most marked amendment in all the symptoms, both subjective and objective.

Still, we must bear in mind the capricious character of scrofulous ophthalmia—apparent cures are too often but transitory intermissions, and a proclivity to the affection most commonly continues until the arrival of puberty, when the changes occurring in the organization at this period alter the balance of predisposition to diseased action in different structures, and the eye becomes less obnoxious to assaults. Can art establish the immunity which this crisis confers, or, as it were, anticipate the important radical changes incident upon it? I am inclined to think that the principle of establishing artificial drains in scrofulous diseases generally is not always correctly apprehended—the depraved and unorganizable products of the constitutional disease, must find some local vent, or else invade the different organs and textures of the body—setons and issues eliminate the *materies morbi*, until the fundamental vice is extinguished by time, or yields to collateral agencies. They can never directly strike at the latent radical evil, but, acting as depurating channels, may prevent the deposition of heterologous products from the blood, until the establishment of the normal vital conditions of the system. Viewed in this light, setons are deserving of more general adoption in all strumous diseases; for myself I feel satisfied that in obstinate relapsing cases of phlyctenular ophthalmia, more especially those following upon or complicating chronic articular disease, when protracted suppurative action has diminished or ceased, setons may be employed with the greatest advantage, as well to avert mischief from vital organs as to preserve the integrity of the eye.

The beneficial influence of change of air in phlyctenular ophthalmia is universally acknowledged, but all practitioners may not be aware of the singular effects of a short sea-voyage in this disease. A few years ago a little boy, who had been a patient of mine for some time previously, crossed from Londonderry to Glasgow, to consult Dr. Mackenzie: he was ordered quina and a collyrium of sulphate of zinc; remedies which, although fairly tried, had already failed in my hands. The child returned in a few days, and surprising was the amendment that had taken place in so short a period; vascularity had greatly subsided; ulcers and specks, which resisted for weeks the action of the most varied applications, were half healed or scarcely perceptible, and a most inveterate photophobia had yielded, as it were, to some magic

spell. I might be inclined to attribute the marked change in this instance to some accidental circumstance or coincidence in the course of this notoriously uncertain affection, but that I am aware of another case in which a precisely similar result occurred; I can, therefore, at least mention the expedient as one deserving of trial.

Although in the foregoing observations I have expressed my opinion as to the futility, or even imprudence, of forcing a child suffering from acute ophthalmic hyperæsthesia out of doors, with a view of overcoming the intolerance by exposure of the eyes to a strong light, I can speak with equal confidence, in chronic cases, of the absolute necessity of the practice. No agent possesses the same power, or exerts the same restorative influence; its exclusion prolongs the affection almost indefinitely. But to obtain the good which this renovating stimulus is capable of exerting, the patient must not be compelled abruptly to "face the light," as is too commonly practised; on the contrary, he must be trained by slow degrees, but steadily and perseveringly, to resist the painful impression first produced, until the abnormal irritability of the retina or other nerves is exhausted or removed, a result greatly promoted by ventilation, exercise in the open air, and the other adjuvantia already noticed.

That form of hyperæsthesia which I have denominated "ciliary" is not, according to my experience, so commonly observed in connection with strumous ophthalmia as with rheumatic and some other affections of the eyeball. I had, very lately, an opportunity of observing it as a sequela of arthritic iritis, and formerly had often occasion to witness an exquisitely painful affection of the ciliary nerves, attended with intolerance of light and other distressing symptoms, produced mechanically by the pressure of hard particles of the crystalline lens against the iris after keratonyxis,—an operation for cataract, at the time I was a student in Dublin, almost exclusively resorted to by one ophthalmic surgeon in the metropolis. My experience, however, of simple scrofulous ciliary hyperæsthesia is limited: a very chronic case under my care, after the failure of other remedies, yielded, apparently, to ten drops of liquor cinchonæ with two of Fowler's solution, given three times a day.

The substance of the foregoing observations may be briefly stated in the following propositions:—

That in all cases of phlyctenular or strumous ophthalmia there exists, of necessity, a special lesion of the nervous apparatus of vision.

That this lesion is the cause of photophobia and the other pathognomonic symptoms of the disease.

That it precedes, in most cases, the development of the inflammatory or objective phenomena; and that these phenomena are directly influenced by this condition, and but remotely by the constitutional disorder.

That the lesion in question is a state of hyperæsthesia, or exalted

sensibility of certain nerves, viz., the optic and retina, and the ciliary and conjunctival branches of the ophthalmic of the fifth pair.

That the phenomena attendant upon photophobia—namely, contraction of the pupil, spasm of the orbicularis, sneezing, and lachrymation,—are the results of reflex action, displayed in a morbid form under the influence of this lesion.

That inasmuch as the impression of light upon the retina is competent to excite closure of the eyelids as well as contraction of the pupil, as proved by an experiment of Magendie, optic hyperæsthesia may be admitted to exist as an isolated pathological condition, capable of producing photophobia independently of other nerves.

That the symptoms of ophthalmic hyperæsthesia vary in intensity and character, according as the nerves referred to are separately or conjointly affected; and that physiological experiments, as well as pathological observations, sanction the division of the lesion into three forms.

That the first form, (optic hyperæsthesia) is characterized by the impression of light producing a luminous or chromatic glare, attended with a peculiar and distressing, but not painful sensation in the eyes; and that its symptoms, subject to occasional intermissions, commonly precede for several days the appearance of inflammatory phenomena.

That the second or complicated variety of the lesion—that which engages all the nerves before mentioned—being quickly followed by the objective symptoms of strumous ophthalmia, can seldom be recognised for any length of time as a simple nervous affection, although invariably present in all unequivocal examples of the disease.

That ciliary hyperæsthesia (third form) is best distinguished from the other varieties by the neuralgic character of the pain, and that it more frequently follows than precedes the ophthalmic disease.

That a distinction should be made between the ordinary relapsing cases of strumous ophthalmia and those rarer examples of the disorder in which the symptoms pursue a course of greater certainty and steadiness, inasmuch as the therapeutical indications differ in the two varieties.

That in cases of phlyctetular ophthalmia attended with inveterate photophobia, where a satisfactory inspection of the eyeball is desirable or necessary, the anæsthetic influence of chloroform is the most suitable expedient.

That when scrofulous ophthalmia occurs in connection with chronic articular, or such like diseases, and protracted suppurative action is on the decline or has ceased, much benefit may be expected from setons and issues as prophylactic remedies.

That arsenic is a most valuable agent in invererate cases of this disease, more especially those complicated with chronic eruptions of the scalp or cutaneous surface generally.—*Dublin Quarterly Journal, August*, 1857, *p.* 100.

88.—*Needle-Hook for Operations for Artificial Pupil.*—Mr. Bowman has recently employed with much seeming advantage in several cases. an instrument which he devised several years ago, and published an account of it, but the use of which has been, we believe, as yet confined to himself. It consists of a needle-pointed hook, and enables the operator to enter the cornea, and drag out the iris with the same instrument, thus obviating the necessity for employing two. In cases in which the lens still exists, care must be taken to hold the instrument on the horizontal plane, as its needle point projects considerably beyond the hook, and in the attempt to seize the iris with the latter, might possibly, if unduly depressed, wound the lens. These, however, constitute but a small proportion of those requiring operations of this kind; at least such has been the case at Moorfields recently, since the introduction (by Mr. Critchett), of extraction through a closed pupil. For making an artificial pupil after extraction, the needle-hook is certainly admirably adapted, and could not possibly inflict injury. In Mr. Bowman's hands we have never seen any difficulty occur in the withdrawal of the hook; nor could it, indeed, easily occur with due attention to the mode of managing it. One advantage which it possesses is in respect to the very small opening made, and the prevention of escape of the aqueous.—*Medical Times and Gazette, July* 25, 1857, *p.* 89.

89.—LINEAR EXTRACTION OF SOFT CATARACT.

[This method of extraction of Cataract has recently been practised with much success at the Moorfields Ophthalmic Hospital. A very small opening is made, and the operation is called linear, denoting that the corneal incision is to be about a line more or less in width.]

The case of a man on whom Mr. Critchett operated on Tuesday week afforded a striking illustration of its benefits. He was the subject of very impaired vision in the left eye, the consequence of a blow; and in the right, which was his better one, by the aid of the ophthalmoscope, it was discovered that the retina in parts was detached. Still, with this eye he could see fairly, when suddenly the lens became opaque. He was thus reduced to a state of almost total blindness and, although the nervous structure was known not to be healthy, it became exceedingly desirable promptly to get rid of the cataractous lens. The latter was of milky-white appearance, with a tinge of blue, and was equally opaque in all parts. With a broad needle Mr. Critchett made a puncture on the outer side of the cornea, about a line in width, and with the same needle lacerated the capsule, and broke up the lens. The lenticular substance itself proved to be less opaque than was its capsule. A channelled curette having been introduced, the whole of the fluid part of the lens escaped; and lastly, with a little manœuvring, the capsule itself passed into the aperture, and, being seized by forceps, was removed bodily. The pupil was

now perfectly clear. With a blunt probe a small portion of iris, which had prolapsed, was tucked back, and the pupil was then perfectly round. The man at once exclaimed that he could see. No inflammation whatever followed the operation, and when brought before the clinical class, three days after, there was nothing about the eye by which it could have been known that it had been operated on. With the aid of a glass the man could see about as well as he could prior to the formation of the cataract. In a case in which Mr. Bowman employed this method of operation in a young girl, about a month ago, the result was just as perfect and nearly as speedily attained as in the preceding. If the capsule be not opaque at the time of the operation, no attempt is usually made to remove it. The cases deemed suitable for this method are those in which the lens is soft and without a nucleus. We have been informed that, in Paris, M. Demarres even ventures to attempt to remove dense nuclei by it, catching them in the extremity of the curette; but such practice is, we believe, deemed to be too uncertain of success to be adopted at Moorfields. It would necessitate a larger opening than is usually made, and, as it is impossible to always estimate correctly the dimensions of the nucleus, would probably, in not a few cases, result in disappointment. If the nucleus be left, it is very liable to fall down behind the iris, and become a source of irritation either to the ciliary bodies or the retina. In case for which either of them are adapted, the linear extraction has the great advantage over the method by solution that it completes the operation at once, thus preventing the risk of local or general disturbance ensuing.—*Med. Times and Gazette, Sept.* 5, 1857, *p.* 249.

90.—ON CATARACT.

By James Vose Solomon, Esq., Surgeon to the Birmingham Eye Infirmary.

When an eye is cataractous, but otherwise healthy, and its companion in the possession of useful vision, is it expedient to remove the opaque lens? The cataract having been successfully removed, what will be the effect of the operation upon the vision of the patient?

The opinion of the profession has been many years divided respecting the propriety of removing a fully-formed cataract by operation when the companion eye is healthy, or its lens so slightly opaque that useful vision is enjoyed. The discussion of this question will be narrowed, and a solution of it more easily attained, if we exclude from consideration instances of hard cataract occurring in old people, and requiring for their cure to be extracted through a half section of the cornea—an operation that exposes the eye to the risk of destruction; and if we limit the controversy to cases where the lens is of soft or moderately firm consistence, and which are capable of being safely and successfully removed by that beautiful and simple process termed "the operation of solution," or absorption—Keratonyxis.

The advantages to be derived from the successful removal of a fully-formed single cataract, the eye being in other respects normal, will be, according to my experience and reflections, considerable, and may be enumerated as follows:—

1. The natural brightness, intelligence of expression, and beauty of the eye are restored—results, it will be admitted by the most prejudiced, of no mean importance to young females, servants, and others.

2. A more extended range of vision is obtained, *especially laterally;* the eye even unassisted by a cataract glass is capable not merely of seeing, but of identifying the features of strangers at a distance of from one to three yards, and men from other objects at from 20 to 200. In Case 31, quarter inch type could be clearly read.

3. Whatever degree of vision may be realised, the tendency to fatigue and functional disorders in the anatomical perfect companion is lessened or cured (as in Case 32).

4. The operation by giving to the posterior internal tissues of the globe their natural stimulant, light, is a means of improving and maintaining their nutrition, and hence is a preventive of ocular diseases of anæmic origin.

5. Moreover, through sympathy the general nutrition of the corresponding eye will be invigorated, a striking and very instructive illustration of which is presented by Case 35, when the cure of the cataract was the prelude to recovery of sight in its amaurotic companion. A parallel instance has been recorded by Serres of Montpellier, in the Annales d'Oculistique, Fèv. 1843. Furthermore, in Cases 33, 34, 36, 37, 38, &c., even an incipient opacity of the companion lens underwent, in the opinion of those who observed and reported them, a natural cure. The possibility of this, however contrary to our preconceived opinions or daily experience, seems to have been placed beyond dispute by the clinical experience of the late Mr Guthrie, an authority, it will be admitted, in every respect competent to form an accurate opinion on such a subject. Analogues to the instances of amaurosis above referred to are, I conceive, to be found in those instances where the excision of a disorganized globe has proved curative of disease in its sympathising companion.

In order to preserve the function of the lensless eye in a normal condition, and confer the greatest possible amount of benefit to the individual's vision, it is desirable that a two or two and a half inch cataract glass should be occasionally worn for the binocular view of near and minute objects, as for instance in reading and writing, &c., and a six-inch for the observation of those at a long distance. The focus of the eyes of long-sighted persons is more difficult to adjust than that of others; yet, so far as my experience at present extends, it may always be accomplished if sufficient pains be taken. In one case I succeeded when an optician had failed.

6. The vision of the eye operated upon having been preserved in a state of vigour by the means indicated, it will be self-evident that, in

the event of accident or disease causing blindness in its fellow, it would be immediately available for use; whereas if the cataract has been allowed to remain, the unfortunate patient will have to wait, in a state of blindness, its removal by operation, and will perhaps afterwards obtain only a limited degree of vision, if any, in consequence of long continuous inaction of the special functions of the organ.

The objections that have been raised to operative interference are two in number:—1. That the vision, in consequence of the unequal adjustment of the two eyes, must be confused. 2. That the operation may endanger the safety of the sound eye, by exciting sympathetic disorder.

In regard to the first my experience will show that confused vision is the exception, and not the rule, and when present can be readily corrected by a cataract glass. It may be added, that in the course of the nine years I have been officially connected with the 'Birmingham Eye Infirmary,' no patient has ever complained to me of the result of the operation, but many have testified their satisfaction. The late Mr. Guthrie has referred to some cases in which there was confusion of vision, but he does not state that the inconvenience was irremediable by spectacles; indeed, judging from what he has written on the subject, it is evident that he was not aware of the degree of excellence of sight that may be enjoyed by their aid, and that he had overlooked the physiological part of the question; also, that in the event of a mechanic engaged in working upon minute objects being affected with confused vision from the cause indicated, and not feeling at liberty in the presence of his employers to wear a glass, there would be the alternative of following the example of watchmakers, who labour many hours consecutively with one eye closed.

The objection, that the operation may be the cause of sympathetic inflammation in the other eye, is a myth which a few months' attendance at an Eye Infirmary where traumatic and other cataracts are submitted to operation, will effectually dissipate.

In the discussion of the questions propounded at the head of this paper I have designedly abstained, as much as possible, from quoting authorities, except in the form of well-authenticated cases, because the question is one of fact purely, and not of names, and can be decided in a satisfactory manner only by an appeal to clinical records and well-established physiological principles.

Having adopted the latter course, I maintain—

1. That a single cataract of soft consistence occurring in an eye otherwise healthy should be submitted to an operation for its cure.

2. That confused vision is the exception, not the rule, and when present susceptible of correction by an optician's lens.—*Med. Times and Gazette, Oct.* 24, 1857, *p.* 433.

91.—*On the Use of Sulphate of Atropia in Diseases of the Eye.* By Dr. F. Mosler.—As the result of practical investigations upon the use of sulphate of atropia in ophthalmic medicine, Dr. Mosler arrives at the following conclusions:—1. That the sulphate of atropia is preferable to the pure alkaloid for therapeutic purposes. In a state of purity the sulphate, employed with the necessary precautions, even in large doses (such as five grammes to an ounce of distilled water), produced no unfavourable effects upon the eye. In using it, care must be taken of the absorption of the tears running from the eye and mixing with the solution, and the absorption of the solution itself is to be guarded against. 2. In ophthalmoscopic investigations, atropia has rendered especial services in many cases; in order to diminish as much as possible the inconvenience felt by the patient in its use, attention must be paid to the investigations of Donders, upon the more or less enduring operation of the different strong solutions. The employment of atropia is not *à priori* to be recommended in every ophthalmoscopic investigation. 3. In inflammatory states of the eye, especially those characterized by violent pain, intolerance of light, and abundant lachrymation, as particularly in injuries of the eye, with or without affection of the iris, we have been acquainted with atropia as an essentially soothing agent, as by its operation on the sensitive nerves of the eye it possesses the power of removing rapidly the state of excessive irritation. As a decided remedial agent, it appears moreover to act by its operation upon the motor nerves in the eye, inasmuch as, according to the explanations of Dr. Von Gräfe, it paralyses the muscles which are found in and about the eye, and which in such cases exercise an excessive pressure upon the internal structures of the eye, and in consequence of the return of the blood being impeded, give rise to accumulation of blood in these structures. It is thus explained why abscesses of the cornea under its use are less perforating and more easily healed, and why hypopyon is more rapidly absorbed. 4. Astringent eye-waters, especially the stronger cauterizing fluids, are better borne, and are attended with more rapid success, when the excessively heightened sensibility of the eye, which exists in the cases where this remedy is applicable, has been previously deadened by atropia. 5. Cauterization of the eye, employed only once daily with all necessary precautions, is better borne in many cases than the more frequent instillation of eye-waters, which every time appear to induce a new and well marked irritation.—*Brit. and For. Med.-Chir. Review, July* 1857, *p.* 235.

92.—*Belladonna for Dilating the Pupil.*—Mr. John C. Savery, House-Surgeon to the Northampton General Infirmary, says:—I have lately mixed ℥ss. of glycerine with ℥j. of extract of belladonna, when I have used the latter for dilating the pupil; it renders it pliable and elastic, and does not produce that disagreeable tightness complained of when the simple extract gets dry and hard.—*Med. Times and Gazette, July* 11, 1857, *p.* 45.

93.—ON THE TREATMENT OF OBSTRUCTION OF THE FAUCIAL ORIFICE OF THE EUSTACHIAN TUBE BY THICKENED MUCOUS MEMBRANE.

By Joseph Toynbee, Esq., F.R.S., Aural Surgeon to St. Mary's Hospital, &c.

[The object to be attained in this disease is the reduction of the congestion and hypertrophy of the mucous membrane surrounding the orifice of the tube. If uncomplicated with any affection of the tympanum it will generally yield to the use of general remedies, and of applications to the fauces alone, though much patience and perseverance is often required.]

General Remedies.—The most efficient general remedies are—abundant and active exercise in the open air, and warm clothing. Flannel should be worn next to the skin. The throat should not be wrapped up by handkerchiefs, comforters, boas, &c.; these are the sure way of weakening the throat; they keep it warm for a certain time, and when they are removed, the air, which is frequently colder within than outside the house, causes relaxation of the mucous membrane within. When a single tie handkerchief is worn within doors no addition need be worn without; in children, where the throat is entirely unprotected within doors, all that should be allowed without is a small silk handkerchief, loosely tied. I am thus particular in giving these directions, because I have been so frequently convinced of their great importance.

The surface of the body should be daily sponged, or rubbed with a coarse towel that has been dipped in cold water, and then wrung out. As those children who suffer from the affection now being considered have usually a languid circulation, and the nervous energy is below par, the towel bath appears to be the more suitable remedy. The towel should be very coarse, and one part of the body is to be rubbed at a time; the skin, especially of the neck, throat, and spine must be made to become red, and to glow. This bath may be used either in the morning or the evening, but once daily is sufficient. If the patient is very delicate, and will not well bear the shock produced by the cold towel, tepid water may be used. In addition to this bath—indeed, to supersede it in cases, especially in youths about 14 to 16, in whom it is not likely to be carried out effectually—the tepid or cold plunge bath may be resorted to. Where it can be practised, sea-bathing should be resorted to; but in all cases where the whole body is immersed, it is advisable to wear an oil-skin cap, to keep the head dry; not because the application of water to the head is objectionable, but because there is so great difficulty in getting the hair perfectly dry, and the slow evaporation from it is often decidedly injurious. Plunging into a fresh-water river in warm weather is not objectionable. In the treatment of the cases under consideration, too much stress cannot be laid upon the necessity of exercise, bracing air, and cold bathing. I

have known them overcome the most obstinate cases of obstruction of the faucial orifices of the Eustachian tubes, when all local remedies and medicines had given but slight or only temporary relief. Care should also be taken respecting the diet of the patient; pastry, sweets, fat, &c., should be avoided, vegetables to be given in small quantities only; the principal food to be bread, especially that containing the bran, meat, and light puddings, as rice, sago, &c. Children should not be overworked in their studies, and they should retire early, the rooms in which they live and sleep should be airy and well ventilated (it is a good plan to have the bed-room door ajar during the whole of the night), and, above all, it is important that the head should be kept above the bedclothes. To overcome the very prevalent habit of breathing through the mouth, whereby the cold air keeps up a constant irritation to the faucial mucous membrane, the patient should be directed to sit down quietly for a certain time daily, and practice the habit of nasal respiration; although it may at first seem difficult, the mucous membrane of the nose soon yields and the air passes freely. Many years since, I pointed out the peculiar erectile tissue of which the nasal mucous membrane is composed, not only in man, but in most mammalia; this tissue renders it a most efficient natural "respirator."

Medicines.—All medicines that give tone to the system may, in succession, be resorted to. Cod-liver oil, iron in its various forms, iodide of iron, iodide of potassium, small doses of the bichloride of mercury, the mineral acids, and vegetable bitters will be found useful.

Local Treatment.—The most efficient local treatment is undoubtedly the nitrate of silver. It may generally be used in a solid form. Messrs. Weiss have made for me a caustic holder, the end of which is capable of being turned at such an angle that the caustic may be passed behind the soft palate and applied to the mucous membrane of the orifice of the tube as well as to that of the fauces. The solid nitrate of silver may be rubbed over the surface of the tonsils should they be enlarged, and of the faucial mucous membrane about once a week. It should produce considerable irritation and a copious flow of mucus. Stimulating gargles are also to be used; the combination of acids and astringents are of service; iced or cold water is often beneficial, and in order to ensure the application of the cold water to the orifices of the tubes, and also to improve the condition of the mucous membrane of the nares, cold water may be drawn up through the nose and passed out by the mouth. When there is much congestion of the faucial mucous membrane a leech or two, or a stimulating liniment or vesicating paper may be applied over the region of the tonsils.

The use of the Eustachian Catheter.—It has been, and indeed it now is, the custom with some surgeons to pass the Eustachian catheter repeatedly in cases of obstruction of the Eustachian tube. Now what is the effect of this procedure? If the mucous membrane be not much thickened, air is blown into the tympanic cavity, and the power of

hearing is at once restored. As soon as the catheter is withdrawn the tube again closes, and its muscles have not the power to open it, the air that has been forced into the tympanic cavity soon disappears, and the deafness returns. The patient again feels relief from the same proceeding with a similar result, and if the mucous membrane is allowed to remain in the same state no permanent relief is obtained. On the contrary, the repeated use of the catheter seems rather to increase than to diminish the congested state of the membrane. Under certain circumstances, however, the Eustachian catheter is of great value; the judicious course respecting it is to use the above-named plans for the purpose of reducing the hypertrophy of the mucous membrane. In the majority of cases they will be found sufficient to cure the disease, but if after pursuing them for ten days or a fortnight no amelioration ensues, the Eustachian catheter may be introduced, and air may be blown through the tube into the tympanum. It is possible that this operation may tend to facilitate a cure by removing mucus from the tube, or by separating the lips of the faucial orifice. The operation, however, should not be repeated for several days, indeed it is not generally required again.

The mode of applying the Eustachian Catheter.—It has been already stated, that the orifice of the Eustachian tube is posterior and external to the posterior aperture of the inferior nasal meatus. The catheter I am in the habit of using is not quite so large as an ordinary crow-quill, and as the outer part of the Eustachian tube is oval, I have suggested that the extremity of the catheter should be of the same shape. The end of the catheter held by the surgeon should be rather larger than that for introduction into the tube, in order that the end of the *explorer*, or the nozzle of a syringe can be fixed in it. This end, having a ring on one side of it opposite to the concavity of the curved end, is to be taken into the right hand of the surgeon; the patient being seated in a chair before him, the instrument with the point downwards is to be glided backwards by the side of the *septum nasi*, until the curved end reaches the cavity of the fauces, when it is to be pressed backwards against the mucous membrane of the posterior part of the fauces. It is then to be drawn slightly forwards and then rotated outwards, so that the extremity may turn upwards and catch the orifice of the Eustachian tube, which can be distinctly felt, and the fuller rotation of the instrument is prevented. The catheter is then to be pressed slightly outwards and backwards, and the surgeon will feel it to be embraced by the tube.

For the purpose of securing the instrument a frontlet bandage, with a pair of forceps attached, has been used; this, however, may be dispensed with in all ordinary cases; instead of it the surgeon is now to take the catheter in his left hand, and while holding it lightly, so as not to cause pain to the patient, which the use of the frontlet invariably does, he inserts into the dilated end of the catheter the small end of the explorer, or syringe. The *explorer*, which in my hands has

wholly superseded the use of the air-press, consists of an elastic tube about 18 inches long, one end of which, for introduction into the mouth of the surgeon, is composed of a flat portion of ivory with one or two deep incisions upon it, so as to enable it to be easily held between the incisor teeth; the other end has a small piece of steel tubing attached to it, which fits accurately into the end of the catheter. When the catheter has been properly fixed in the tube, and held there by the left hand of the surgeon, one end of the explorer is to be placed in his mouth while the other is introduced into the catheter, and held there by the left hand. Thus the surgeon has the right hand at liberty; with this he takes the otoscope, and introduces one end of it into the ear of the patient under examination, and it is held there by the patient; the other end is held by the surgeon in his own ear, or it may be made sufficiently light to remain there without holding, and his right hand is free. The medical man then proceeds to blow air gently through the explorer, at the same time that he listens, by means of the otoscope, to ascertain whether it enters the tympanum; and if it does enter he can distinguish the peculiar sound which is produced. When the tympanum is free from mucus the air is heard to pass in a stream against the inner surface of the membrana tympani; when mucus is present a peculiar gurgling is heard; and if the mucous membrane is thickened a peculiar squeak or other bubbling may be perceived. It is not advisable to blow hard into the ear, but to make a few successive puffs, listening during each to detect what sound may be heard in the tympanum. Sometimes no air enters, the mucous membrane being too thick to allow it to pass; under such circumstances it is not well to attempt to force air into the tympanum; great mischief has frequently resulted from such a proceeding; the mucous membrane has been lacerated, the air has been forced into the submucous tissue, causing extensive emphysema. Still more serious results have occurred: the patient has been killed instantaneously, the cause most probably being the effusion of air through the fenestra rotundæ (its membrane having been lacerated) into the labyrinth, the shock upon the nervous system causing instant death. Inasmuch as the forcible distension of the tympanum while blowing the nose, frequently produces giddiness by pressure upon the labyrinth, it need not be a cause of surprise that the effusion of air into the labyrinth should prove fatal.

The Excision of the Tonsils.—On the supposition that the tonsils, when enlarged, pressed against and closed the faucial orifice of the Eustachian tube, the operation for excision or partial excision of the tonsils has long been practised for the relief of deafness. Although, as already shown, the tonsil, however hypertrophied, cannot cause occlusion of the Eustachian tube, still the removal of a portion in cases where it is *much enlarged* is sometimes of service, by diminishing the congestion of the mucous membrane at the orifice of the tube, and it

perhaps also may operate beneficially by allowing the muscles of the tube to act more freely. This operation is, however, very rarely required, and the best rule to follow is not to excise a portion of the tonsil, which appears to have important functions independent of the fauces, unless it evidently interferes with the general health of the patient, or unless the obstruction of the Eustachian tube resists the other measures already indicated.—*Medical Times and Gazette, August* 29, 1857, *p.* 212.

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MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

94.—ON THE PHYSIOLOGY AND TREATMENT OF PLACENTA PRÆVIA.

By Dr. Robert Barnes.

It is now generally taught, that in partial placental presentation it is enough to rupture the membranes; and that afterwards the case may be left to nature altogether. These cases, in short, have been classed, as far as treatment is concerned, in the same category as the cases of hemorrhage from detachment of the placenta from parts of the uterus remote from the cervix. Wigand and Nägele especially insisted upon this, that the plug might be trusted to far more than was generally done, and that by the aid of this means, and the evacuation of the liquor amnii, many cases might be treated without turning.

The principle and rule of treatment of flooding before delivery that were generally taught until Professor Simpson revived and urged the doctrine of Kinder Wood, and Radford, may be expressed as follows:

1. When the placenta is not found at the os uteri, or when it is found at one side only of the os uteri, trust greatly to nature: use the plug, ergot, or, lastly, rupture the membranes.

2. When the placenta is found extending completely over the centre of the os, there is no safety but in delivery. The only doubt in this case is as to the time and manner of effecting the delivery.

For the last few years the position of the obstetric world in relation to this problem in practice may be sketched as follows:—

1. In cases of partial placental presentation, rupture of the membranes, the use of the plug, and other temporizing expedients, will generally be sufficient.

2. In cases of complete placental presentation, and in those of partial, where the flooding is unusually profuse, we have to choose between two methods: forced delivery, and artificial detachment of the placenta. But concerning this choice there prevail many conflicting opinions.

a. With some, perhaps many, there is no question in any case. These see no safety but in delivery, and condemn the practice of detaching the placenta absolutely.

b. Others, with Kinder Wood, would detach the placenta in those cases of exhaustion where forced delivery cannot be resorted to with-

out peril to the life of the mother; or, with Dr. Radford, in those cases also where the os is partially dilated, where the membranes are ruptured, and where strong contraction exists—a condition, I presume, considered to contra-indicate turning; and also in cases of narrow pelvis.

c. Others extend their faith in this method to the full latitude of the precepts of Dr. Simpson. These would detach the placenta in all the following cases:—

"1. When the os uteri is rigid and undilatable.
2. In first labours.
3. In premature labours.
4. In labours supervening earlier than the seventh month.
5. When the uterus is too contracted to allow turning.
6. When the pelvis or passages are organically contracted.
7. In cases of exhaustion.
8. When the child is dead.
9. When the child is premature and not viable."

In the not very probable event of a case occurring that should not fall under one or other of the preceding heads, it would remain to be considered whether evacuation of the liquor amnii or turning should be resorted to.

Here I may close the historical part of our subject. I will now proceed to explain what I conceive to be the *true* anatomy and physiology of placental presentatipns.

Causes of Prævial Attachment of Placenta.—It would indeed be a triumph exceeding, because superseding, all therapeutical improvements, if we could arrive at such a knowledge of the etiology of placenta prævia as would enable us to obviate the occurrence of this abnormity. That prophylaxis will ever supersede therapeutics in this matter can, however, scarcely be anticipated. Still it is eminently desirable never to lose sight of the fundamental question of etiology in our inquiries.

Why is it that the placenta is occasionally developed on the cervix uteri? It is well to ask first, why it is that the placenta is commonly developed at the fundus? Let the consideration of the law precede that of the exceptions. The reasons appear to be obvious enough. As the ovum emerges into the uterus from the orifice of the Fallopian tube, it is usually caught in a fold of the softened, thickened, and coagulated lining mucous membrane of the uterus in the immediate vicinity of the point of entrance. There it fixes itself, and there it grows; and that part of the superficies of the chorion which lies in apposition with the original seat of attachment naturally becomes developed into placenta, whilst the villi of the remaining part of the superficies disappear, or at least do not assume the placentary character. It is a matter of doubt, however, in my mind whether there be one part of the superficies of the chorion which is primordially more especially destined to be developed into placenta than the rest.

What part of the superficies shall be developed appears to depend upon the accidents of contiguity to the uterine mucous membrane, of disease, and other circumstances: that is, that part of the chorion which is in apposition with the decidua vera will be most disposed to furnish the placenta. But if we examined the pregnant womb and ovum at an early date, even as late sometimes as the fourth month, we perceive that the entire superficies of the chorion is in intimate and extensive vascular relation with the decidua. And even at the end of gestation, it is no uncommon thing to find that the villi of the chorion have not altogether disappeared from any part, but that there still remain numerous vessels all over its surface lying in contact with vessels of the decidua, and which may be regarded as analogous to the developed placenta. There is a beautiful specimen of an injected uterus and placenta of the eighth month in the museum of St. Thomas's Hospital illustrating this fact. There is another fact illustrating this position. In a most remarkable case of placenta prævia which I dissected, the placenta was found, at the end of the ninth month, spread over at least five-sixths of the entire surface of the uterus, leaving but a small space at the very fundus of the uterus which was unclothed by placenta. Why, it may be asked, did the placenta in this case spread itself so extensively? I believe the following is a rational conjecture:—The placenta was everywhere extremely thin. The ordinary superficial development was insufficient for the nutrition of the fœtus; more and more vessels were therefore called for, until they had formed a placenta of the enormous extent we see. Owing to the narrowing of the uterus towards its neck, it is highly probable that sufficient placenta cannot be easily developed in the case of prævial attachment without spreading beyond the usual limits, or acquiring very unusual thickness. Thus Levret has drawn especial attention to the shape of the placenta in prævial attachment; it is represented from nature in Hunter's well-known plate. The organ is much thicker in the middle than at the edges, and when placed on a flat surface it takes the form of a mamelon. I myself have observed that in cases of central attachment the placenta is commonly much larger than it is when seated at the fundus.

That the uterine mucous membrane can at any part furnish the uterine element of placenta is certain. The fact of our having to deal with placenta prævia is a sufficient proof. Why should not the chorion at any part furnish the fœtal element? Facts seem to show that it may. The remarkable example I have just described is strong evidence. Further evidence may be drawn from the observation of specimens of extra-uterine pregnancy. In such cases, the ovum being lodged in an abnormal situation, ill adapted to supply sufficient nutriment for the embryo, it is not uncommonly found that the greater part or the entire surface of the chorion is developed into placenta. There is a well-marked example of this in Guy's Museum.

There is a form of placental growth by no means uncommon, which

further corroborates the view that any part of the chorion may be developed into placenta, according to the requirements of the embryo. There are the *placenta spuria* and the *placenta succenturiata*, to prove that true placental outgrowths may take place at a distance from the main placenta. Sometimes a placental mass of the size of a crown piece or larger is found wholly separate from the main placenta. This is not an unfrequent cause of secondary hemorrhage after delivery. The *placenta succenturiata* remains adherent after the expulsion of the true placenta and the bulk of the membranes.

But there is yet another fact, of extreme importance in relation to this subject. I have been struck with the frequency with which prævial attachment is complicated with disease of the placenta and fœtus. In examining and reflecting upon particular cases it has appeared to me that placental tufts may shoot out from one part of the chorion in preference to other parts, because some points, being diseased, are unfitted for efficient placentary development, or because some parts of the chorion, itself healthy, may be in contact with an unhealthy portion of decidua. Thus, if the fundal mucous membrane is diseased, there will be a tendency to placental development on that aspect of the ovum which is directed towards the lower segment of the uterus.

Another circumstance illustrating the frequent complication of disease with prævial placenta, is adhesion. It is important, however, not to confound the cases of true adhesion, in which there is organic change of structure, or abnormal deposit in the decidual portion of the placenta, with those more frequent cases in which the adhesion is merely the result of absent or ineffectual contraction of the uterus. We shall see by-and-bye that the muscular structure about the lower segment of the uterus is far less purposely adapted to cast off the placenta than is the muscular structure of the fundus. This is one cause—a frequent one, and often unsuspected—of placental adhesion or retention. During my researches into the disease of the placenta, many placentas have been brought to me, which having been retained, had been manually separated from the uterus on account of supposed morbid adhesions. It was rare to find in these specimens any trace of disease.

In a recent excellent paper, the present Dr. Legroux says, that placenta prævia mostly occurs in pluriparæ, and that it is due to the greater than normal enlargement of the uterus, which thus allows the ovum to spread its attachments lower than is possible in the more inferiorly contracted, or pyriform, uterus of primiparæ.

One circumstance has struck almost every observer, and that is, the frequency with which the prævial attachment of the placenta has occurred in the same patients. Some women are, therefore, especially prone to this complication. Is it rationale to conclude that some women are especially prone to an "*accidental*" attachment of the placenta to the lower segment of the uterus? No. It is not then an

"accident;" but an occurrence depending upon definite and ascertainable causes.

I believe the etiological arguments thus enunciated are well founded. They do not exhaust the etiological history. There are probably other causes. To complete the list is, I submit, an object eminently deserving of research. We should not rest contented with the quaint evasion of Portal, that these things happen "selon qu'il plait à la nature de se jouer."

Diagnosis of Placenta Previæ.—Are there any signs by which we may discern the existence of placenta prævia before the occurrence of labour? This question is important, because, if we knew that this complication existed beforehand, we should be forearmed, and the better prepared to encounter the impending difficulty. Levret has examined the question with his usual acumen. He enumerates the following signs of central or lateral placenta:—

1st. The belly of the patient is not pointed, or rounded as a ball, but somewhat flattened.

2ndly. It appears as if it were divided into two parts, as in the case of twin-pregnancy; but that which essentially distinguishes the first case from the second is, that the division is not found exactly in the middle, nor according to the vertical line of the body, but more on one side than the other, and a little obliquely. Moreover, if we question the woman, she will admit that in the first months of pregnancy she felt a swelling, with hardness, in one or the other side of her belly.

3rdly. This hardness had gone on increasing, and had never changed sides.

4thly. This side is the most painful spot of the whole belly, and that in which she feels the movement of her child the least.

These signs are perhaps wanting in precision, but their existence in any given case should at least indicate more minute investigation.

Gendrin gives two signs. He says that a pulsation may be felt at the os uteri not synchronous with the mother's pulse; and, secondly, that owing to the interposition of the placenta *ballottement* cannot be performed. Neither of these signs is universally true.

It may be stated that the lower segment of the uterus is generally larger, softer, more fleshy than in ordinary gestation. The presenting part of the child either cannot be made out at all, or very indistinctly; and occasionally, when the os uteri will admit the finger, the quaggy placental mass may be felt. Sometimes a persistent dragging pain in a particular part has led to a stethoscopic examination, when the cervical attachment of the placenta has been accurately determined. This I have myself experienced.

Dr. Cohen, of Hamburg, has described the means of diagnosticating placenta prævia in a paper to which I shall again have occasion to refer. His especial object is to determine which side of the lower

segment of the uterus the main bulk of the placenta adheres to. He says the side of the uterus to which the main placenta grows is more swollen. In by far the greater number of cases this side is *painful*. The pain in the right epigastric region known to every accoucheur is a suffering so common in these circumstances that we regard the cases in which it does not appear there or on the other side as exceptional. Whenever the pain was strong, Cohen always found considerable fibrinous deposits in the placenta, and often stringy adhesions of the fœtal placenta to the uterus. The smaller part of the placenta, he says, is attached either to the *right* or *left side;* so seldom to the fore or after side, that for diagnosis it is enough to examine the right and left sides.

Moreau places little confidence in the condition of the os and cervix. He says: "One only phenomenon may cause a suspicion of the cervical insertion of the placenta: this is the epoch at which the hemorrhages occur. Generally, they take place early in pregnancy, but they never arise before the moment when the neck of the organ begins to unfold itself. Most frequently, it is from the sixth to the seventh month."

The indications in diagnosis may be usefully summed up as follows:

1. The general signs, such as flattening the abdomen, division of the abdominal tumour, and especially swelling and pain in one side of the pelvis pointed out by Levret, should lead to minute exploration by the finger and stethoscope.

2. Abortions, disease of the placenta, dead children, and placenta prævia in former pregnancies, should also incite to minute physical exploration.

[The source of the hemorrhage is doubtless the uterine surface itself, for the structure of the placenta is opposed to the rapid transit of blood, and moveover a detached portion is always soon choked up with coagulated blood, and if more proof still be required, Dr. Merriman saw the blood issuing from the uterine surface in a case of inversion. Is the hemorrhage arterial or venous? Dr. Mackenzie contends that it is arterial, from a consideration of the following facts.]

1. Having opened the uterus of a pregnant bitch, and detached the placenta, he observed that the blood flowed freely from the uterus, and that it was *arterial*.

2. Having injected defibrinated blood into the hypogastric arteries of a woman, the placenta being previously partially detached, he again observed that the blood flowed exclusively from the uterus, and from the utero-placental *arteries*.

3. He adduces the recorded observations of many practitioners to show that, in women flooding from placenta prævia, the blood was arterial in colour.

This last evidence is necessary to complete Dr. Mackenzie's case, for the evidence drawn from his experiment on the dead woman is

not enough to prove that venous blood may not regurgitate and escape from the uterine sinuses in the living woman. Dr. Chowne has shown how freely water will escape from these sinuses by injecting the vena cava backwards.

It is certain that in the majority of cases it has not been very carefully noted whether the blood issuing from the vagina was arterial or venous. But in some it is particularly specified. I am tempted to quote the following case, given by A. C. Baudelocque, from Baudelocque the elder.

Case 6.—"A woman, seven and a half months advanced in pregnancy, sat down upon the grass for a few moments to rest after a long walk. Soon after, she felt in the fundus of the womb and in the loins dull pains, which she attributed to fatigue. On the same evening, her abdomen appeared larger, and it increased so much during the night as to excite her surprise. Having but feeble pains, she got up, and took, as usual, a cup of milk coffee. Immediately after this breakfast, she lost some water, tinged with blood, and experienced slight faintings, which obliged her to return to bed. When seen by Baudelocque, at half-past twelve o'clock, she was pale and dying; her pulse could hardly be felt; she fainted every minute. I thought at first, he says, that she had lost torrents of blood, but no clots had passed, and the linen was hardly stained by a sanguineous serosity. The neck of the womb, situated deeply towards the sacrum, was fully developed; the orifice was opened to the size of a piece of twelve sous, and its edge was soft. Slight pains were felt from time to time, expelling every time a little *clear scarlet blood*, the escape of which was followed by fainting. I brought the orifice down to the middle of the pelvis, dilated it gradually, and in less than half an hour it exceeded the size of a large écu. During this time, a forceps was being sought for. As soon as it was brought, I opened the bag of membranes, and the head presenting. I seized it with the instrument, and extracted it. The child gave no sign of life. Before the rupture of the membranes, and when the mouth of the womb had opened to the size of an écu of six livres only, such a large quantity of *blackish clots* had come away, that I estimated it at more than would have filled a hat. Then there escaped a considerable quantity of *fluid scarlet blood*. The faintings became more marked and frequent..... The placenta presented itself spontaneously, and was extracted almost as soon as the child. Its external surface, a very small portion excepted, was covered with coagulated blood; it had occupied the fundus of the uterus. From this moment the woman lost but little blood....."

I offer the following commentary upon this history with confidence. The hemorrhage was due, as Baudelocque concludes, to detachment, probably almost complete, of the placenta. The placenta had not been adherent to the neck of the uterus. The symptoms indicate an internal hemorrhage. The appearance of the placenta, when removed, and the history of the case, point to detachment of the placenta as

the cause of the hemorrhage. The source of the hemorrhage was not the neck of the womb, for the symptoms of profuse internal hemorrhage, and the escape of bright scarlet blood externally, were observed before any examination or any attempt to dilate the mouth of the womb, which might be supposed to have caused laceration of its substance, had been made. The bright scarlet blood escaped on the occurrence of the pains, and each loss was followed by fainting. The large quantity of blackish clots that came away in a mass was that blood which had been first lost, which was the result of the internal hemorrhage. This blood, from being retained in the womb, had had time to coagulate, and had been blackened by contact with the liquor amnii. All the blood which was observed at the moment of escape was arterial in character; and this arterial blood could have no other source than the arteries of the uterus.

Drs. M'Clintock and Hardy, in their admirable work, p. 206, relate a case of hemorrhage from complete placental presentation, in which it is stated that "there came a sudden gush of about *a pint of florid* blood."

I have myself distinctly observed the arterial character of the blood escaping under similar circumstances. It is also to be borne in mind that the sudden intermitting gushing character of the discharge is more compatible with an arterial than with a venous source.

Believing, however, as I do that the weight of evidence turns in favour of the views of Dr. Mackenzie, I do not think that the venous origin of flooding can be altogether excluded. In a state of uterine muscular atony, such as often attends flooding from placenta prævia, the mouths of the uterine sinuses must remain patulous, and, unless obstructed by clots, may easily give passage to retrogressive blood. The cases of what Dr. Chowne has properly called "passive hemorrhage" seem to establish this fact.

[We must next inquire into the varieties of the seat of placental attachments.]

The placenta may be attached to the fundus or upper zones of t uterus—*fundal* placenta; it may be seated on the middle zones—*lateral* placenta; it may encroach downwards upon the cervical zones—*latero-cervical* placenta; or it may grow entirely over the inferior pole, rising on all sides so as to occupy the cervical zones—the *cervico-orificial* or *central* placenta. The fundal and lateral placentas are not, unless under very exceptional circumstances, liable to detachment, or to lead to flooding, before the birth of the child. The latero-cervical and the central placentas are, however, so liable. The extent to which this liability goes is greatly affected by the extent to which the encroachment takes place within the cervical zones. In this case there may be little or no hemorrhage; but should the encroachment proceed further down, the danger of hemorrhage much increases. There are cases of flooding before the birth of the child, in which no placenta

can be felt, and which are yet strictly cases of placenta prævia. How, it may be asked, do we get evidence of this? Nothing is more simple.

The following case shows one kind of proof:—

Case 7.—On the 13th May, 1852, my assistance was required by one of the midwives of the Western General Dispensary. A poor woman, weakened by poverty and hard work, having had two children at full term and of full size, was in labour at nine A.M. For two days previously she had had hemorrhage, which was still going on. The head was low in the pelvis and lying in the first position, and there appeared to be sufficient room; it had, according to the midwife, been in the same position for four hours without any advance. The pains had ceased altogether. Pulse feeble; face pale; great exhaustion, anxiety, and depression of mind. Fearing that further hemorrhage might be fatal, I determined on delivering by forceps. Whilst waiting for the instrument, I directed the midwife to give an enema. I comforted the patient by assurance that she would do well. Almost immediately after, effective pains returned, and the head was expelled in an hour. No further hemorrhage. Child still-born.

It appeared to me that the uterine contractions were arrested in the first instance under the influence of anxiety and terror. The midwife, before sending for me, had sent for Mr. Cholmeley and Dr. Babington (she was a patient of Queen Charlotte's Hospital), and more than two hours had been thus lost. My arrival and assurances restored her confidence; and under the beneficial influence of that feeling the uterine contractions returned. The decidual surface of the placenta presented numerous specks of osseous deposit; the margin of the placenta presented large fresh coagula of dark colour in the substance, and very large fresh coagula were attached to the very edge, and had evidently proceeded from a rupture of the circular venous channel which courses round the placenta.

It is this presence of coagula in the margin of the placenta which proves that it had been detached during labour, and that it had encroached upon the cervical region of the womb. In cases of this kind it is often remarkably well seen how dependent the hemorrhage is upon inactivity of the womb, and how completely contraction checks it. Some most instructive cases of the class have been described by Dr. Tanner and by Dr. Stephen Monkton, of Brenchley. They unfortunately neglected to record the state of the placenta after removal. But Dr. Monkton clearly adopts my view of the nature of these cases. He says, "They approximate to the unavoidable hemorrhage of Rigby; the placenta being not prævious, but sufficiently near the os to come within the scope of that expansion which occurs about the cervix and lower segment during the last months."

Case 8.—On the 21st of June, 1849, a young woman at the full term of her first pregnancy died in convulsions, under suspicion of poison. I assisted at the post-mortem examination by order of the

coroner. The placenta was attached to the whole anterior wall of the uterus from the fundus down to the cervix, but not quite reaching to the mouth. The position of the placenta was exactly that which is presumed to have led to the hemorrhage in the cases just referred to.

Recently this subject has been experimentally examined by Dr. Von Ritgen. He found that the bag of membranes burst at the edge of the placenta in 22 cases; it burst at one inch from the edge in 8 cases; between one and two inches in 12 cases; between two and three inches in 16 cases; three inches in 5 cases; between three and four inches in 4 cases; at four inches in 6 cases; between four and five inches in 8 cases; at five inches in 3 cases; in six inches in 6 cases; and at eight inches in 3 cases. It follows that since the distance of the edge of the placenta from the rent is absolutely decisive as to the distance of the edge of the placenta from the os uteri, that the edge of the placenta rested on the os uteri in 22 cases, and was within one inch in 32 cases, and so on. This proves that the placenta has commonly a much lower seat than has hitherto been believed.

This frequent latero-cervical attachment of the placenta has other important bearings in obstetric practice. I must beg permission to digress for a moment to refer to them. It was pointed out by Levret that it was a frequent cause of laborious labour and of post-partum hemorrhage. The attachment of the placenta to the lower segment of the uterus so modifies its thickness, vascularity, and capacity for contracting equally with the other portions of the uterus situated in the same zone, that the labour is rendered painful and lingering; and, when the child is born, the faulty position of the uterus, added to previous exhaustion, disposes to a renewal of hemorrhage.

I believe these considerations present a rational explanation of a multitude of cases of præ-partum hemorrhage, lingering labour, cross-births, and post-partum hemorrhage, the cause of which has been altogether overlooked.

Having considered the varieties of seat of the placenta, we are naturally led to examine the relation of the several parts of the muscular structure of the uterus to the placenta in its different positions. The general disposition of the muscular fibres of the uterus may be taken to be pretty accurately determined. There is a general accordance amongst anatomists concerning the leading points. The dissections of the Hunters confirmed, correcting somewhat, the description of Ruysch, and these in their turn have been confirmed by the dissections of Sir Charles Bell, Professor Owen, and others. Preparations may be seen in most museums which exhibit clearly the disposition of the muscular fibres in the different regions. I must, however, recite to you the description of Sir Charles Bell, not only on account of its graphic beauty, but also because he has laid the anatomical foundation of those physiological views concerning prævial placenta to which I was led by clinical observation.

"It has been proved by the sections of the uterus made in different

states of its contraction, that the order of the muscular fibres is calculated so as to close the vessels; that where nature has provided for the attachment of the placenta, there the broken vessels are guarded by the provision of the surrounding muscular texture; but we know also that during this contraction of the superior part of the womb, the lower part dilates and relaxes. Now if the contraction of the womb be essential to the safety of the mother, what will be the effect of the attachment of the placenta to a part of the womb which must relax during the labour! Every one knows the peculiar danger of *placenta prævia*, that each labour-pain as it returns increases the violence of the flooding instead of checking it.

"I have been led to conclude that *the placenta cannot be partially separated if it be attached in a regular circle to the fundus of the uterus*: it cannot be partially separated, and cannot be separated bodily until the uterus is permitted to have a great degree of contraction by the delivery of the child; the circular muscles of the fundus being agents in a double capacity, that is, both in expelling the child, and in constringing the uterine vessels; by the time that the child is expelled, the vessels of the fundus are greatly diminished in diameter. Further, the place and strength of these muscles being perfectly regular and uniform, their action must have the effect of equally drawing the surface of the uterus, which is in correspondence with the margin of the placenta; but no one part of it will be separated until the general restriction is nearly completed. This will not be the case when the margin of the placenta extends irregularly, or when the placenta is attached to the side of the uterus. After the delivery of the child in cases of flooding, it *is not uncommon to find a portion of the placenta low down in the uterus, and separated, whilst the greater portion remains attached to the fundus.* In examining the inner surface of the uterus by dissection, I have seen the part corresponding with the placenta irregular in its form, and *extending towards the side and neck of the uterus.* In such circumstances of the attachment of the placenta, the retraction on the lower part of the womb being to a greater extent than the fundus, will account for the too early separation of that margin of the placenta which stretches towards the orifice, and also for the hemorrhage which is a consequence of this partial separation, but in the progress of the labour, and after the discharge of the waters, the more powerful efforts of the uterus draw the muscular fibres more closely around the bloodvessels, and then the flooding ceases."

I am then entitled to rest the anatomical foundation of my views upon the authority of Sir Charles Bell.

[Dr. Barnes has shown, in cases of placenta prævia, that detachment of the portion implanted within the cervical zone of the uterus may be enough—certain favourable conditions concurring—to control the hemorrhage.]

Now this partial detachment is an operation that admits of being

accomplished by the introduction of one or two fingers, and is therefore feasible under the precise circumstances which preclude turning or total detachment.

We have, then, here a new remedy, one applicable at the very juncture where ordinary means are impossible or dangerous. As contrasted with the operation of totally detaching the placenta, it has the further advantage of not endangering the life of the child.

As contrasted with forced delivery it has also the advantage of being less hazardous to the child.

I shall presently describe an operation based upon an imperfect appreciation of my views, proposed by Dr. Cohen, of Hamburgh. It consists in detaching the smaller segment of the placenta, which adheres to one side of the cervix. This operation is certainly calculated to be of eminent service in certain cases; and I have no doubt it has often been performed undesignedly, or without the guidance of an intelligent principle, when endeavouring to rupture the membranes and turn. That has been done tremblingly, as an accident, and without intelligence, as an unavoidable step towards the attainment of a different end, which was of itself the means of safety—the real end that a true physiology would have dictated.

The operation which I propose is, to carry the detachment further, so as to separate all that part of the placenta which adheres within the cervical zone or region of dangerous placental seat.

It remains to endeavour to generalize the varieties of cases of placenta prævia; and to endeavour to define the methods of treatment more particularly applicable to each variety.

1. We have those terrible cases where the os uteri is rigid and undilated, the flooding profuse, the powers of life ebbing fast; where to wait for spontaneous arrest of flooding, or the natural dilatation of the os, is to wait for death. These are pre-eminently the cases for resort to the operation referred to. It must, however, be first stated, that this class admits of being further subdivided. There are cases in which contraction of the uterus is going on; there are cases—more dangerous still—in which contraction is absent. Labour with relaxation is dangerous under almost every condition: it is eminently so when complicated with placenta prævia.

Where contraction is present, we possess one necessary element of safety; we may be satisfied with the artificial separation of the placenta from its attachment to the cervical zone. Where contraction is absent, we must at the same time use every available means of rousing the contractile energy of the womb. Sometimes the stimulus imparted to the reflex system by the necessary manipulation is itself enough to excite contraction. But not always. We must then give stimulants internally; apply warmth to the surface if the skin is cold and there is great depression; rub the abdominal muscles and the body of the uterus firmly. This is a case where the ergot of rye is especially indicated. If it fail, then we have galvanism, which rarely or never

fails—an agent perfectly under control, which we can apply and intermit at pleasure, and whose force we can graduate as we like. Dr. Radford has, I think fairly established the value of this agent in cases of this kind.

Dr. Cohen, of Hamburgh, has described an operation which may be distinguished as the *Partial Cervical Detachment of the Placenta*. It is not founded upon a full appreciation of the true physiology of placenta prævia, but I have no doubt that in many cases the operation will prove sufficient to control the hemorrhage and convert the labour into a natural labour. Dr. Cohen describes it as follows:—

The Operation of Partial Cervical Detachment of the Placenta.—The object of this operation is, *to convert a central into a lateral placenta*, in those cases where the symptoms are too urgent to warrant us in trusting to the spontaneous efforts of nature to effect this end. By it we seek to change a labour, *quoad* placental attachment, from preternatural into natural.

Time.—Even in this comparatively simple operation it is desirable to wait until the os uteri is a little expanded. It may be justifiable to trust some time to the plug; but if the symptoms are too urgent for delay, one or two fingers may be at once passed through the os. Seek to determine which side of the uterus bears the great bulk of the placenta; feel for the edge of the placenta on the opposite side; rupture the membranes during a pain; tear the membranes freely from the border of the placenta, and sweep the finger round half the circumference of the os uteri internum, so as to detach the placenta completely from that side of the uterus to which the lesser portion adhered. This done, there is nothing to prevent the os uteri from expanding, and carrying the liberated portion of placenta over to the side where the bulk of the organ adheres. In many cases this will be enough to arrest the hemorrhage. Nature herself will do the rest.

This is the extent of Cohen's recommendation. He affirms distinctly that he has in numerous cases practised this method with success; that he has never lost a mother, rarely a child. It is to be regretted that he has contented himself with this general expression of the result of his experience, and that he has not recorded the cases in which he has put this practice to the test. For want of this, his essay is essentially dogmatic. It certainly is quite in accordance with my own repeated observations of the natural course of labour with placenta prævia. It may be contended that the good done is really effected by the rupture of the membranes. I have no doubt whatever that the evacuation of a portion of the liquor amnii, by permitting the womb to diminish its volume, greatly favours contraction and expedites labour. But it certainly does not, as I have before proved, account for the good result itself. One advantage of the loosing the placenta from its adhesions to the os and from the membranes, lies clearly in releasing the os and cervix from a mechanical impediment to dilatation, and further in obviating the rending of the substance of the placenta during

dilatation. Some obstetric practitioners to whom I have mentioned this subject have expressed a doubt whether the placenta is liable to be torn in this way. I have, however, seen such cases, and many are on record.

If the hemorrhage should continue, or be renewed with urgency, I propose as the next step,

The Total Cervical Detachment of the Placenta.—The detachment must be carried further, by sweeping the finger round between the placenta and uterus on that side to which the main bulk of the organ adheres. In this manner the whole of that part which had been seated within the cervical zone will have been detached. Now this detachment will not *of itself* stop the hemorrhage. We may, I think, tranquillize our minds as to the effect on the mother of that small portion that will escape from the detached placental surface. But the uterine vessels may pour forth blood until the hæmostatic resources of nature or art come into play. The resources of nature are those I have before described: continued contraction of the muscular structure of the womb, the contractile action of the coats of the uterine arteries, and the formation of coagula in their mouths. In the majority of cases these resources are sufficient; the hæmostatic process may, however, be further assisted by plugging again. A method of plugging is recommended by high authority, which appears deserving of attention. Moreau advises the application of a lemon, the end of which has been cut off, to the os uteri, and to retain this *in situ* by firm pressure through rags or sponge. The acid juice favours coagulation as well as the pressure, and retention of the blood. The soaking of the sponges or rags used for plugging in vinegar is a common practice; but it seems to me reasonable that more powerful styptics should be used. I suggested some time ago the injection of the sesquichloride of iron. Dr. Schreir, of Hamburg, has related some instances in which this agent was employed with success. M. Dupierris, of Havana, advises the use of tincture of iodine. He says that he has injected a mixture of one-third tincture of iodine with two-thirds water, in one hundred cases of uterine hemorrhage of various kinds with uniform success. He relates three cases of hemorrhage attending labour. The sesquichloride of iron, however, appears to me the preferable agent.

By the proceedings I have described, we may reasonably hope that in the vast majority of cases the hemorrhage will cease. If it should not, time will have been gained; the os uteri may have become soft and dilated; and, in the event of its being felt necessary to resort to forced delivery, this operation may be performed with comparative ease and safety.

2. There is another class of cases, happily more frequent than the preceding, where there is less urgency, more scope for temporising. We have seen that the expansion of the os may be effected without necessary loss of blood to such an extent as to constitute flooding. In the conduct of such cases we have in the physiology which I have enunci-

ated a guiding principle that carries a rational faith in the resources of Nature. It is in these cases that the natural tendency to restrain the floodings caused by the successive detachments of zonular portions of placenta is most strikingly marked. A knowledge of this principle will give an intelligent confidence in all those measures, such as the plug, ergot, rupturing the membranes, which have been recommended on various physiological or empirical grounds. Even in these cases the operation of Cohen, of freeing the smaller segment of the placenta, so as to allow it to be carried over to the side of the uterus which holds the main body, may be of essential service.

3. There is a third class of cases in which the principle is all-important. I mean those cases where, after even alarming losses, the hemorrhage has ceased spontaneously. Under the prevailing dogmas the arrest of hemorrhage inspires no hope in the breast of the accoucheur. He is taught to believe that it will "*unavoidably*" return; he hastens to deliver: and the poor woman who had reached the haven of safety is destroyed by the operation, a victim of the "nimia diligentia medici." —*Lancet, July* 4 *and* 18, *August* 15, *and October* 10, 1857, *pp.* 2, 52, 159, 357.

95.—APPLICATIONS OF THE NEW PHYSIOLOGY OF PLACENTAL ATTACHMENT TO THE TREATMENT PLACENTA PRÆVIA.

By Dr. R. Barnes.

The rules of treatment at present in force have all been dictated or influenced by theoretical doctrines essentially erroneous. One word in especial has exerted a most tyrannical and mischievous influence: the word "unavoidable hemorrhage," being assumed to embody the whole theory of placenta prævia, has created and maintained a blind and indiscriminating belief that interference, in the form of forced delivery, is imperatively called for. A striking word too often catches the assent by postponing investigation, and, like the sword of Alexander, cuts the knot it cannot unloose. The cases of placenta prævia, as they are met with in practice, offer considerable varieties of kind, of degree of danger; they cannot be treated on one uniform plan. We are not in all cases of urgent hemorrhage to force the hand through the os uteri and extract the child; we are not in all cases to force the hand into the womb and detach the whole placenta. There are cases in which either of these operations is more dangerous than the flooding itself. Nor have I a panacea to offer in lieu of these operations. Although I believe that a full appreciation of the theory I have enounced is essential to the intelligent conduct of any given case of placenta prævia, I do not pretend that the particular mode of treatment which is the more direct deduction from this theory is universally applicable; but it supplies a new, an additional remedy, often applicable precisely when the usual modes of treatment are either impracticable or dangerous.

1. I shall adduce evidence to prove that dangerous, and even fatal, flooding may occur at so early a stage of labour that all methods of forced delivery are absolutely excluded.

2. That in another class of cases, in which it has been presumed that circumstances admitted of forced delivery, the operation itself proved dangerous, and even fatal.

The woman may die before delivery is practicable. Fatal hemorrhage may occur from a very small detachment of placenta, and before the os uteri has undergone any material dilatation. Thus, Professor Davis says "he had met with many examples of even fatal results of profuse uterine hemorrhage unaccompanied by any amount of dilatation of the orifice of the womb." ('Principles and Practice of Obstetric Medicine,' p. 1040.) Professor Hamilton says that "in the month of September, 1816, he was called to two cases where the patient seemed to be *in articulo mortis* from the deluge of the discharge, and where, nevertheless, the os uteri was obstinately rigid."

But, in the presence of even the most terrible flooding, we are warned in the most emphatic manner, even by those authors who advocate forced delivery as the only hope, against forcing the hand through the os before this structure is dilated or dilatable. Dr. Edward Rigby says: "In no case is it proper or safe to force delivery by artificially dilating the os uteri where it is contracted and unyielding; but *when the placenta is presenting it is peculiarly dangerous*, for even slight laceration of the os uteri will be followed by serious consequences; .... its vessels are immensely dilated, and large ones are ruptured which cannot be closed by the firmest contraction of the womb." Nægele has also proved that death has been caused by the continued hemorrhage proceeding from an os uteri so injured.

Dr. Collins records the following history:—

Case.—"There being no chance of life without speedy delivery, we determined to make the attempt, *although the parts were badly prepared.* The hand was cautiously introduced: .... great debility succeeded the operation, with a slight discharge of blood at intervals..... On examining an hour after, a laceration of the neck of the uterus was discovered, commencing at its junction with the vagina..... Dissection verified the result of the vaginal examination."

Taught, no doubt, by such instances, this excellent author emphatically says: "I know of no operation more truly dangerous both to mother and child than the artificial dilatation of the os uteri and turning the child."

Cases such as I have cited are by no means exceptional. Our clinical records teem with instances of resolute, I might say desperate, turning, with the view of saving the patient, where the operation, not the flooding, was shown to have caused her death. Let me quote one more, out of several, from that rich storehouse, the 'Clinical Midwifery' of Dr. Robert Lee (p. 158.):—

Case.—"On the 22nd February, 1840, I examined the body of

Mrs. C——. A great uterine hemorrhage had taken place spontaneously six weeks before, when she was seven months pregnant. Another took place on the 19th February, which continued till the evening of the 21st, when her medical attendant, *with some difficulty*, introduced the hand into the uterus, perforated a portion of the placenta, and turned the child. The head was extracted with difficulty. The placenta soon followed, but she soon after began to sink, and died in an hour and a half. There was an extensive laceration in the mucous and muscular coats of the cervix uteri, on the left side, and a smaller and more superficial rent on the right side. The placenta had adhered to the whole circumference of the cervix."

The following case, also from Dr. Lee, exemplifies in the strongest manner the proposition before us :—

Case.—A lady in the eighth-and-a-half month had been attacked with uterine hemorrhage a month before. Two other attacks, at intervals of several days followed. "At one o'clock, Jan. 12th, 1839, the hemorrhage was renewed to an alarming extent, without any pain; about a quart of blood was suddenly lost, and she became extremely faint. At four a.m. the discharge still continued. . . . .The placenta was felt adhering all round to the neck of the uterus, which was thick and rigid and very little dilated. The effect produced by the hemorrhage was so great that *it was evident death would soon take place if the delivery were not speedily completed;* and the state of the orifice was such that it was certain the hand could not be passed but with the greatest difficulty. At eight p.m., Dr. Merriman saw her with us, and agreed that immediate delivery was necessary. I passed the right hand into the vagina, and insinuated my fingers between the uterus and placenta at the back part, and reached the membranes. But the rigidity of the orifice was so great that, though I employed great force for a considerable time, I could not succeed in getting the hand into the uterus. Dr. Merriman recommended rupturing the membranes, and I was proceeding to do this with the fingers, when I felt one of the feet of the child, which I grasped, and brought down into the vagina, enveloped in the membranes, which then gave way. Nearly half an hour elapsed before the version could be completed, and when it was effected, the neck of the uterus grasped the neck of the child so firmly that I experienced the greatest difficulty in extracting the head. A great discharge of blood instantly followed. The placenta was removed, and every means employed to stop the hemorrhage; but the breathing became hurried, the extremities cold, and she died in less than an hour after delivery. Dr. Merriman informed me that a patient of his had actually died under similar circumstances before the head could be extracted."—(p. 156.)

If such are the lamentable results of forced delivery under desperate circumstances, what are the results of forced delivery under circumstances presumed to be favourable? The situation is still full of danger.

At p. 118 of Dr. Collins's book we find the following case :—

Case.—"D. C——, at her full time, was brought to hospital with profuse hemorrhage, the blood literally flowing away from her. Finding the pulse almost imperceptible, the os uteri being partially dilated and in a relaxed state, the hand was passed, and the child delivered by the feet. The hand was introduced immediately afterwards for the removal of the placenta ; the uterus acted well, and expelled both. From the moment of her admission, cordials and stimulants were freely given, which, after delivery, were occasionally combined with opiates ; notwithstanding which, as also the sedulous application of cold, pressure, &c., a slight discharge of blood continued, and she died in two hours. On dissection, the intestines were found completely blanched ; the uterus was contracted to the ordinary size. On making a section of it, a rent was discovered in its mouth, which was evidently the cause of the continued draining. This injury, no doubt, occurred in the delivery of the child, although it was effected with great care, with no difficulty, and very little exertion."

I have no desire to pass over the fact, that in many cases the os uteri, undilated at the time, yields with tolerable facility before the hand, and admits of turning with safety ; or another fact—one of great importance—that occasionally, through a happy coincidence of skill and chance, the feet of the child may be seized by two fingers, and turning performed without the necessity of passing the hand into the uterus at all. Neither of these fortunate occurrences can be counted upon. The voice of experience is loud as to the dangers of turning even when there is no placental presentation. It is decisive in the cases we are now considering.

We have, then, three formidable facts before us :—

1. The woman may die from flooding so early, before the dilatation of the os uteri, that forced delivery is out of the question.

2. If forced delivery be attempted before the os uteri is dilated, a fatal result is eminently threatening.

3. If forced delivery be performed when the os uteri is dilated, it may contract around the neck of the child ; and even if it do not, such injury may be done to the womb in the extraction, that death may follow.

A remedy, then, is urgently required, to replace in certain cases, at least, forced delivery.—*Lancet, Aug.* 29, 1857, *p.* 212.

96.—LABOUR, WITH PERFECT OBLITERATION OF THE OS UTERI.

By Dr. R. G. Mayne, Leeds.

[In this case, though from the character of the pains and other appearances, the labour seemed in an advanced stage, no os uteri whatever could be discovered. Nothing but a smooth polished surface presented itself to the finger. Dr. Mayne considered this must be

from the os being occluded by abnormal substance owing to inflammation, as the patient had experienced much pain in the womb during the early part of her pregnancy.]

I had no instrument with me but a lancet, and time did not allow of going or sending home for anything better, as the vertex, pressing powerfully on the highly stretched wall of the uterus, now reached the *labia pudendi* at every pain. I wound a narrow strip of rag round the handle and joint of the lancet, to render it fixed; and, taking into my service the nurse, who, fortunately, was a young intelligent married woman, I instructed her (placed at the patient's back) to insert the fore and second fingers of her right hand behind the *fourchette* or posterior angle of the vulva, and keep back the parts during next pain, so that I might *see* the actual state of the os, or of the adventitious substance by which it was hidden. This done, there was presented to view a quite smooth and continuous surface, the only distinctive indication discoverable being a slightly more livid hue of the new vascular formation which occupied the space of the natural aperture. I hastily pointed out this to the nurse, who, as well as she was able, marked the distinction. On recurrence of a pain, I made three or four scarifications with the lancet, all in the same line from right to left of the patient, producing an elliptical gap or separation in the new substance. I thus obtained partial admission of the point of my finger, with which I by degrees widened the opening to the extent of a shilling piece, distinctly perceiving that, in so doing, I had to *break down* what was more substantial than membrane—in fact, to the best of my judgment, was homogeneous with the *parenchyma* of the organ itself. I then ruptured the proper membranes: there was a considerable discharge of the waters, and everything went regularly on as in an ordinary case, but so rapidly that, within ten minutes from my using the lancet, a full-sized healthy female child was born; and no unfavourable circumstance has happened to mother or child to this time.—*British Medical Journal, Sept.* 5, 1857, *p.* 75.

97.—ON THE INDICATIONS FOR PUNCTURING THE MEMBRANES.

By Professor Ritgen.

1. *Puncturing the membranes during delivery.*—The object of puncturing the membranes is to obtain a gradual discharge of the liquor amnii, with the intention of obviating some disadvantages that would accrue from leaving them to their natural rupture, or of fulfilling some obstetrical indication. The operation may, therefore, be either prophylactic or therapeutical.

(1.) *Prophylactic puncture of the membranes.*—As a general rule, when the cervix uteri is not occupied by the thicker portions of the child, the water becomes suddenly and completely discharged. The

exceptions to this are rare, and cannot be foreseen. This may be often attended with ill consequences. Thus, (a) *prolapsus of the funis* may be brought about by the sudden rush of the waters. When the funis is felt presenting within the tense bladder of water, this is often burst during attempts at re-position, if the precaution has not been taken to discharge a portion of the waters by a more distant puncture. (b) *Admission of air within the uterus.*—Upon the rapid and complete discharge of the fluid, a sufficient vacuum may be produced to admit the external air to the uterus. This may give rise to great irritation, or even inflammation, of its interior, or may stimulate the child to premature-inspiratory efforts. (c) *The removal of the pressure exerted by the liquor amnii upon the inner wall of the uterus* may be injurious in various ways. First, there is the dynamic effect exerted upon the uterus by the removal of the stimulus, the immediate result of which must be to enfeeble, or even relax and paralyse the organ, the capillary vessels being unable to resist the impulse of the blood, and hemorrhage ensuing. The opposite condition of increased irritability often soon succeeds to this. Next is the mechanical effect, one of the consequences of which is a diminution of the pressure upon the placenta, and the diminution of its resistance to the vascular impulse, whence also hemorrhage may arise. These consequences are the more likely to occur the larger the quantity of the water, and the greater consequent distension of the uterus, as in twins, &c. Too early a separation of the placenta with hemorrhage, is not of infrequent occurrence in cross-births. Another frequent ill effect of the discharge is the loss of the ovoid form of the uterus, and the consequent disturbance of the progress of labour that takes place. The wall of the uterus is brought into immediate contact with the child's body, and irritation, cramp, or inflammation, may result. Gradually, too, by close application of the walls of the uterus the parts of the child became so surrounded that the progress of labour or the application of instruments is seriously interfered with; and but too frequently fatal pressure is exerted upon the child, funis, or placenta. All these ill consequences may in most cases be prevented by the timely puncture of the membranes. When the membranes are thin and the water abundant, and irregular action is present, the membranes easily burst; and in such cases a puncture for the gradual discharge of the waters should be practised as soon as the state of the os will permit. The author usually employs a silver wire, having a smooth rounded point, and terminating at the other end in a ring, for the convenience of holding it. When not in use it is kept in a catheter, and thus is always at hand.

(2.) *Therapeutical puncture of the membranes.*—The following circumstances furnish indications for this interference: (a) *Excessive distension of the uterus.*—When the uterus, containing a full-timed child, is unusually distended with liq. amnii, we should puncture as soon as the preliminary pains have sufficiently opened the os uteri. We

have the above-mentioned inconveniences to obviate, and to secure a delivery free from the delays, interruptions, and other irregularities that may occur. When the distension is due to a plurality of children, when there is no reason for delay, the puncture should be made, in order to induce a gradual diminution of size, and a gradual expulsion of the child, the organ then gradually and gently adapting itself to the body of the second child; and if this last have not reached maturity, it may be retained yet longer in utero. Moreover, the occurrence of a cross position in the second child will in this way be frequently prevented; this being a consequence of the over-spaciousness of the uterus, and is often observed when the first child has been expelled by a few pains, before the capacity of the uterus becomes equably diminished. If the early puncture of the membranes be neglected, the premature separation of one or both placentas may take place, giving rise to hemorrhage, and necessitating the delivery of the second child. (b) *Cross position of the child.*—After a disquisition upon the influence which the positions of the mother may exert upon the production or prevention of this, the author goes on to state, that the tendency which prevails at the commencement of labour for its conversion into a breech or cephalic presentation, is much interfered with by the too sudden discharge of the waters, while it is favoured by their more gradual discharge. Puncturing the membranes, and keeping the patient upon the same side as that on which the head is found to be, has, in his hands, in a very great number of cases, prevented the necessity of turning at a later period of the case. (c) *General debility of the uterus.*—For the relief of a moderate degree of this, which is usually due to over distension, there is no better means than the puncture, the organ recovering its contractility under the gradual discharge of the waters. There is, however, met with in old worn-out pluriparæ a form of general debility of the uterus, attended with great relaxation, but unaccompanied with excess of liq. amnii. In these cases contraction should be obtained by means of spirituous embrocations, the administration of quinine and cubebs and the like, reserving the employment of the puncture, together with that of ergot, according to the indications which may be present at a later stage. (d) *Footling cases.*—The author has found these cases terminating either very rapidly or very slowly. In the first case the pains were powerful and rapid, and the soft parts yielding, the child being born in two or three pains after the sudden rupture of the membranes. In the other case, many hours may pass before the pains become powerful and the soft parts pliable, and the long sausage-formed membranes are long before they break. Here puncturing is indicated, so that the water may flow gradually away without the child being excited, as is often the case in foot presentations, to premature attempts at breathing. (e) *Partial debility of the uterus.*—This is especially observed as a relaxation of the lower and anterior portion of the uterus, which the adjacent abdominal parietes participating in, gives rise to the pendulous belly in

advanced pregnancy. During labour the unrelaxed portions of the uterus thrust the child towards the relaxed portion, which has, during pregnancy, assumed more or less of the ampullar form. This, becoming enlarged during labour, the parts of the child are thrust in it above or in front of the pubis; and if the sac attains both great depth and breadth, the child may even assume a cross position within it. If it is very deep without being broad, the head usually sinks into it, while the shoulder or the arm may pass into the os uteri. Too much liquor amnii, too large a child, or the two together, may increase it. The indication here is to restore the contractility of the weakened uterine parietes, as without this the labour will not proceed of itself. This is not to be done by the position of the patient, or by the application of pressure, which only adds to the mischief by inducing fatigue. Still less must we attempt the drawing forwards of the highly-placed os uteri by means of the finger, this only exciting the parts to partial excessive action. The application of the forceps is also here not only difficult, but improper. The worst of all is, however, when some urgency renders it necessary to finish the labour by turning. The os uteri opposes great difficulty to the entrance of the hand and the passage of the child, while the relaxed portion of the uterus exerts no expulsive power upon the portion of the child yet unborn. The finding and bringing down the feet, and turning the child, are also often very difficult. All these ill consequences are, for the most part, to be obviated by strengthening the relaxed portion of the uterus. The employment of bandages, stimulating embrocations, and general strengthening remedies must be commenced with during pregnancy, and continued during labour; and the puncture of the membranes should be resorted to as soon as the state of the os uteri will admit of it, very small doses of ergot also being given. Several days may, however, elapse before the restoration of the tone is effected. The patient should lie on one or the other side, the projecting portion being supported against the end of a round cushion. Sleep should be procured, and a nutritious, but not stimulating diet employed. The insensibility of the relaxed portion is gradually replaced by pains which may become severe, and the ampulla becomes smaller and tenser. The ergot is now discontinued, and may have to be replaced even by anodynes, while the stimulating applications are exchanged for emollient ones. Tepid injections of decoction of cicuta, milk, or oil should be thrown into the vagina; and in a contracted, hard, or sensitive state of the vagina and os uteri, frictions, either of mercurial ointment alone or with extract of belladonna, should be employed. The above course of treatment Dr. Ritgen recommends as the result of a long-continued successful experience. If called to the case only after the membranes have largely ruptured, he recommends still the same course of procedure, making no attempt for the artificial extraction of the child, unless inflammatory action seems imminent. (f) *Uterine cramps.*—If spasmodic pains set in early, and threaten a premature rupture of the

membranes, it is best to anticipate this by the puncture, in order to prevent a larger rupture and a rapid discharge. (g) *Delayed expulsion of moles, with profuse hemorrhage.*—The puncture of the mole is an efficient means of shortening the expulsion and arresting the hemorrhage. In order to discharge the cavities of the mole repeated punctures may have to be made in various parts. Ergot and the plug may also be required; and when the hemorrhage is very profuse ice-cold water should be thrown far into the uterus. (h) *Premature separation of the placenta, and hemorrhage.*—Forcible delivery should be only had recourse to in cases of the extremest necessity; cold injections thrown high up between the membranes and the uterus, puncture, plugging, and the ergot being otherwise preferable. (i) *Placenta prævia.*—The arrest of the hemorrhage by means of the gradual discharge of the waters, has been long recommended in this case. (k) To the objection that a small puncture is of no avail in very *thick membranes*, the author replies that the punctures may be multiplied, or a thicker instrument employed. Too thick membranes may require for their spontaneous rupture such exertion from the uterus that may lead to its debility or its irritation, or may induce a separation of the placenta and hemorrhage. (l) *Cæsarean section.*—Prior to the performance of this operation it is of importance that the pains and consequent contractility of the uterus should be excited, so that the wound of the abdomen may be made as small as possible, and the uterus contract as soon as possible after the operation. If no urgency prevails, the gradual discharge of the waters by the puncture will best effect these objects.

2. *Artificial Premature Labour.*—Experience has shown our author that, as a general rule, the best means of inducing premature labour is the injection of almost hot water between the ovum and walls of the uterus; but where it is necessary to reduce as speedily as possible the circumference of the uterus, as where the mother is threatened with asphyxia, and when hemorrhage prevails, there is no means comparable to puncture.

3. *Rupturing the Membranes.*—The increase of the number of indications for puncturing the membranes lessens that of the cases in which their bursting is preferable. They must, however be widely burst, (a) When it is necessary to employ instruments, or to introduce the hand; (b) When the child's respiration is impeded by being enveloped in them; (c) When, in the more or less complete absence of liquor amnii, the membranes do not break, but are closely applied to the presenting head, they should be ruptured as soon as the os uteri is wide enough. In this way rupture and separation of the placenta and tedious delay of labour may be prevented. (d) The narrow opening made by puncture may cause delay at a later stage of the labour, and should then be enlarged. (e) When the presenting part prevents the ready passage of the liquor amnii from behind it, and there is a tough projecting bag of membranes, the hastening of the labour, and pre-

venting injury to the placenta should be effected by a large rupture, the puncture being too slow in its operation. (f) For the delay of a too precipitate labour, it is sometimes useful to lay the patient on her side with raised buttock, to widely rupture the membranes, and to press the head somewhat backwards, so as to let as much water flow away as possible, and allow of the close application of the womb to the parts of the child.—*Monatsch. für Gebürtsk.—Med. Times and Gaz. July* 4, 1857, *p.* 13.

98.—ON METASTATIC AFTER-PAINS.

By Dr. Nœggerath, New York.

[We know but little of the phenomenon called metastatic after-pains. Dr. John Power, of London, in his thesis on metastatic labour, has done much to lift the veil of obscurity from this and other similar phenomena.]

In order to give a correct idea of the so-called metastatic pains, we shall present some observations which will prove more instructive than pages of theoretical expositions.

Among the different cases noted by Dr. Power, we find in case 8 a marked instance of uterine metastasis upon the bladder:—Mrs. P., at the beginning of the labour, had genuine uterine contractions, which dilated the os uteri with sufficient rapidity, when we remarked that the pains became suddenly more distressing, though they had no longer their former influence upon the mouth of the uterus. Placing our hand upon the fundus uteri during a pain, we could not perceive any contractions at all, but the woman complained of a very painful sensation just above the symphisis pubis, which ceased after some time, and came back in regular intervals. Mrs. P. had not evacuated her bladder for a considerable time and was prevented from doing so by the pressure of the head against the symphisis pubis. We considered this a case of metastatic pains in the bladder, produced by an irritation of this organ, arising from its being overloaded with urine, and the vain attempts to empty itself. We, therefore introduced the catheter, and drew off a considerable quantity of water. This being performed, regular uterine contractions set in, and labour was soon ended in the most satisfactory manner. Prof. Stein gives, among other very interesting cases, one of metastasis to a part of the nervous system, which is quite removed from the sphere of the uterine nerves. He says, "In this case a great quantity of liquor amnii was present, and, in consequence, the pains were very irregular. Suddenly, all uterine action ceased, and the woman was taken with a violent facial neuralgia. This affection lasted for one hour, when it gave entirely away, and another succession of labour pains set in; these, after some time, ceased, and the prosopalgia commenced, which was exchanged once more for activity of the womb, and so on by turns. At length

the membranes were ruptured; after which, regular uterine action began and continued till the child was born."

Another very singular case was observed by the same author. A woman, when at the full term of her confinement, was taken with general convulsions, which ceased suddenly, but continued in the musculus orbicularis of both eyes, so that she could not open them for two days. Now the womb began its work, and with the first contraction her sight was reestablished.

Many of the authors above mentioned, and especially Pilger, observed that, during a confinement, the pains gave away, and the patient was suddenly taken with an alarming dyspnœa, which ceased as soon as another contraction of the uterus commenced. Others witnessed that the abdominal muscles were the seat of metastatic labour. (Power, Herder.)

This kind of dystochia is of rare occurrence. But there is another very severe and most tormenting affection occurring after confinement, which we find mentioned in almost every treatise on midwifery, yet vainly seek for an explanation of the fact. I mean those very painful affections of the lower extremities, which commence a few hours after the child is born, and last sometimes for two or even eight days. The authors who treat of the said affection, call it "*the crural neuralgia of women in childbed.*" and believe it to be the result of pressure of the fœtal head, or the forceps, or of an inflammatory exudation upon the crural nerves as they pass through the pelvis. I will not deny that this is the case in a few instances. But when these pains follow after an *easy* confinement, where neither a large-sized head, or a forceps operation, or an inflammation of the bowels can be referred to as explaining this symptom, then we have to seek for another explanation.

[The author has had several cases under his observation, which have exhibited this curious phenomenon. In one remarkable case, the pains began to come on about nine hours after delivery of a living full-grown child.]

This morning, at about seven o'clock, the right thigh was suddenly seized with a pain, which soon increased to such violence, nay, fury, that the patient was afraid to move the leg the slightest degree from its position. The lower part of the thigh was the seat of the greatest pain, and especially its external surface extending over the dorsum pedis. The least pressure could not be endured. After the child was born, the woman had not the slightest perception of after-pains. She felt as if her *abdomen was empty*, or *rather not existing*. The uterus was enormously distended, its limit or outlines being scarcely distinguishable, texture remarkably soft and relaxed. Considering this to be a case of metastatic after-pains, I thought the chief indication would be to bring on uterine activity, after which the pain in the thigh should disappear. The result of my treatment proved that I was right.

Shortly after ten o'clock I gave her a large tea-spoonful of powdered ergot of rye (secale cornutum.) Ten minutes past, the patient remarked a discharge of blood from the vagina, the first after her delivery; a quarter of an hour after the administration of this remedy, the woman became more quiet, she ceased to cry, except occasionally, and a painful expression was noticed in her features. Twenty minutes past ten o'clock she said that the former kind of pain had left her thigh and yielded to a very bearable sensation of smarting. At half-past ten o'clock she took the same quantity of ergot, and fifteen minutes later I had the pleasure to see that the patient moved to lay upon her right side; she could bend her knee and move her leg up and down; she even told me now that she *had not the least pain.* When I left her (before eleven o'clock) I could ascertain that the uterus was well contracted, lessened in size, and considerably harder than when I made the first examination. The woman had no relapse afterwards.

[In the second case, the labour, though somewhat tedious, was also safely conducted.]

When I left the woman she felt quite well. The following morning I was called to see her; found her crying out with a violent pain in the lower part of the right thigh. Upon my inquiries, I was answered that, at about half-past eleven o'clock last night, she was suddenly awakened by a kind of straining sensation in her leg, which soon increased to such a distressing painfulness that she was unable to sleep for the rest of the night. Listening to her exclamations, I could easily observe how the painful affection came on slowly, increased gradually, and sunk to a perfect intermission. *She did not feel anything like after-pains*, though she knew this sensation very well from her previous confinements. At eight o'clock in the morning, when she began to nurse her child, the pains, which sometimes affected the left thigh, had somewhat lessened. I could detect no pathological symptom in the affected leg, occasionally I remarked a starting of some muscle, very much like a subsultus tendinum.

But the uterus proved to be very different in form and size from what it was last night, when I left the woman. This organ was much larger, of a more spherical conformation, its texture extremely tender and soft to the touch, so that at first it was scarcely possible to discover its figure through the abdominal walls, though they were thin and collapsed. Its vitality was so much lowered, that hard pressure upon it, which caused much pain last night, was now scarcely perceived. Ordered—

℞. Secal. cornut., recent. pulverat. ʒi.; infus. c. aqu. fervid. ad cal. ℥iij.; add syrup. zingib. ℥i.; one table-spoonful to be taken every half hour.

When I saw her again, at about six o'clock, p.m., she told me that soon after taking the medicine she felt much relieved, and that at four

o'clock, p.m., the pains in her legs had ceased entirely, adding, that she felt them at present more in her back and stomach.

In both these cases, especially in the first one, it is obvious how important it was to have a right idea of the disease in order to adopt the proper treatment. While this patient, on a former occasion, suffered for *five days* from her so-called neuralgia, we were able to remove it entirely in *one hour and a half*.

The latter case is very interesting in regard to the course and diagnosis of the disease. The woman exhibited already symptoms of atonia uteri during her actual labour, and this state continued after confinement. The uterus was in a perfect state of rest as regards both its sensitive and motive power. A part of the nervous activity, properly belonging to the uterine system, became free, and consequently was added to the natural amount of nervous tension in some other part; and, in this instance, the nerves going to the right thigh had to bear its influence. Every one knows that irritation of the mammæ reflects upon the uterus as a stimulus, i.e., brings its nerves into greater activity. Therefore, nursing the child was to rouse the uterine nerves from their inactivity, and this ought to diminish the pains in the leg. This fact was observed in our case as the woman told us herself without even being asked about it.

In explanation of these singular pathological occurrences, we must bear in mind, that there is always present a limited amount of nervous power in the central organs. Therefore, if one part of the body receives a nervous impulse in excess, other organs must be more or less deprived of it; or, when there is prepared in the nervous centres a certain amount of material for the purpose of setting one department of nerves into action, and this department being in itself not properly disposed to receive it, then, another portion of the nerves must attract this amount, and show a greater activity. The same result must happen, when some other part of the system is in such an unnatural condition, that it attracts more nervous force from the centres than is due to it. In this case another organ must lose part of its activity.

These principles applied to the uterine system, we are able to explain the pathology of metastatic pains. When labour begins, the sympathetic nerves and the spinal cord secondarily are called to a physiological energy, which is seen in no other instance of life. Their activity is provoked by the uterus, and in ordinary circumstances directed to the uterus. But in order to perform their duties properly the womb must be sufficiently disposed to attract the nervous fluid to its own sphere. In case of its being in a state of weakness, other organs receive the effect of the overloaded centres, and thus exhibit the phenomenon of metastatic pains. Therefore this complaint is most commonly observed in connection with atonic labor-pains. But if some part or other of the system was previously, or during parturition, in an unhealthy condition, it would be liable to attract to itself

the nervous energy originally due to the uterus, even if the latter was in a state of health. Therefore, we see that, in very many instances of metastasis, the affected organs stood under some morbid influence before or during confinement.

I lately was confirmed in these views of metastasis by a case which I observed in this city in September last. Before relating the case it will be necessary to make some explanatory remarks. It cannot be doubted that, in the central organs of a healthy person, there is always sufficient electricity to maintain a medium state of tension in all the nervous cords, both motive and sensitive, going to the different parts of the body. This amount of central irritation is present nearly to its full extent even if one of the more important organs is in a temporary state of physiological activity, such as the brain in thinking, the stomach in digesting, the uterus in delivery, &c., &c., but if the above views of disturbances in the nervous equilibrium are correct, it must happen sometimes, when one of these organs, being engaged in physiological action, is in a state of excessive irritability during its work, that the amount of specific central energy is not sufficient to answer the requirements of the stimulated organ, and then another part of the system will be partially deprived of its physiological activity.

This was the case in the following instance. In September last, I assisted a lady of New York in her confinement, which went on so rapidly, that labour was nearly completed when I arrived, though I obeyed the call immediately; all I had to do, was to remove the afterbirth. This was her sixth confinement, and on nearly all former occasions she had to suffer from most distressing after-pains; she asked my advice in order to be relieved from that complaint. At about two o'clock, P.M., I was called again to see her. She complained especially about her right leg, so that at first I anticipated having another case of metastatic after-pains. In this I was deceived after a closer examination. It was just the reverse. For she suffered, at the same time, from unusually strong after-pains. The uterus was small, contracted, and hard as a stone. In the right leg she had the sensation "*as if it did not belong to herself;*" it felt benumbed and heavy; she had not the power of moving it. When I touched it she was unable to tell at what place exactly this was done. In short, it exhibited appearances which, in all, were most akin to paralysis. I prescribed a few doses of laudanum and ipecac, which relieved her greatly, and as the after-pains gradually subsided, the limb returned to its natural sensation and mobility.

This case related by itself would be a perfect puzzle to everybody. It can only be understood by comparing it with the above narrated cases of metastatic after-pains, and thus it becomes a key to the right explanation of this intensely interesting phenomenon.—*New York Journal of Medicine, May* 1857, *p.* 287.

99.—ON PUERPERAL FEVER.

By Dr. Edward William Murphy, A.M., Professor of Midwifery, University College, London.

The symptoms of this disease have been so accurately described by numerous authors, that it is only necessary to refer to such of them as will explain the principles of treatment. Every author has noticed varieties in the mode of its attack. Vomiting is sometimes the first symptom, or it may begin with diarrhœa; more frequently a rigor, followed by a violent shooting pain through the epigastrium, ushers in the attack, and this is followed by swelling and extreme tenderness of the abdomen. Lastly, there are cases more progressive, in which tenderness is first observed in the neighbourhood of the uterus, extends to the abdomen, is accompanied by a firm wiry pulse (never the case in the former instances), and presents many of the characters of true peritonitis; the bowels are constipated, and vomiting occurs at a later period.

The manner in which the constitution is first affected by this poison is of importance as a guide to treatment. Douleet thus discovered the value of emetics. He observed in his cases, that vomiting was a first and most urgent symptom, and, so far from checking this, he sought means to promote what appeared to him a natural effort to throw off the disease. His ipecacuanha emetics had the most marked success. The same treatment was tried by others, and failed altogether because the epidemic was of a different character.

Gordon, Hey, Armstrong, and Mackintosh, observed in their cases a rigor followed by the greatest prostration; nevertheless, they boldly employed the largest depletion, and saved their patients. Gooch met with cases of a different kind, in which true peritonitis was a more prominent feature; he found a more moderate bloodletting, together with local depletion, equally serviceable; and lastly describes another subsequent epidemic, in which bleeding killed his patients. This difference can only be explained by assuming a difference in the manner of the attack. Gordon's cases differed from Gooch's in the extent to which the poison was absorbed; while the cases in Gooch's first and second epidemic differ from each other so completely, as to lead to the doubt whether the latter was puerperal fever at all

This difference in the mode of attack will perhaps also explain the cause of success in the various remedies employed, each of them claiming the most marked success, and each of them quite different in their actions. The moment this poison is absorbed, an effort is made to get rid of it through the ordinary channels: hence the vomiting and purging; the effort generally fails, and poisoned blood accumulates at the centres of the circulation, causing a rigor of greater or less severity. The skin, and I believe also the kidneys are excited to remove the poison from the blood. The practitioner who aids this effort succeeds: thus Douleet succeeded with ipecacuanha; Denman with tartar emetic;

Boer with Kermes' mineral; Armstrong with salts and senna. I have been informed also of the value of nitrate of potash as a diuretic in some forms of this malady; but when the effort failed, and a rigor gave evidence of the accumulation of poisoned blood at the central vessels, Gordon and Hey relieved this at once by taking twenty or thirty ounces of blood, and succeeded in a sufficient number of cases to prove the correctness of their practice and the nature of the disease. Depletion to such a large extent could not be explained on the principle of combating peritonitis; but is intelligible as relieving the liver, spleen, and central organs from the mass of poisoned blood. When so employed, it should immediately follow the rigor, because, if time is lost, nervous power is paralyzed, and the very same treatment only hastens dissolution.

Another class of remedies has also been warmly advocated, and has met with considerable success. Many years ago, Dr. Brenan, of Dublin, used oil of turpentine both internally and externally with great advantage. Dr. Copland approves of this practice, and from his experience of a severe epidemic in the Queen Charlotte's Hospital, he came to the conclusion that "there is certainly no remedy so efficacious as a decided and judicious use of spirits of turpentine."

Dr. Copland also found camphor in doses of from eight to sixteen grains extremely serviceable. These remedies are altogether different in their character and in their action from the former; they are not only stimulant, but anæsthetic; both are hydrocarbons, and possess the common properties of these bases; they are useful, not merely in stimulating the constitution against the attack, but by diminishing pain they lessen nervous exhaustion. Nothing relieves the extreme tenderness of the abdomen so much as turpentine fomentation; taken internally, it relieves the tormina of flatus. Camphor also assuages the intensity of neuralgic pains. Reasoning upon these facts, it seemed probable that chloric ether might be serviceable, at least in relieving pain: the following case will explain its effect:—

In 1855 I was called to see a woman who had been seized the day before with puerperal fever. She was lying on the bed with her knees drawn up; the abdomen distended and extremely painful; the extremities cold; and pulse, 150. I did not think she would live till the next day, and ordered thirty minims of chloric ether with twenty minims of tincture of opium every second hour, merely to give some relief to the intensity of her suffering.

The following day I found that the pain had been completely removed, and she was then comparatively comfortable; but there was no change in the pulse. She, however, rallied so far as to continue in this easy state for nearly a week; but the poison had done its work, the vital powers could not recover themselves, and she sank after this protracted struggle.

Very lately two other cases came under my notice. In the first, the woman had been two days ill. She was propped up in the bed, suffer-

ing intense pain, and gasping with painful respirations; the same means gave her immediate relief; but she was too far gone to have any hope of saving her. In the second case, this treatment was carried out so successfully that the woman recovered. I am, therefore strongly inclined to the opinion, that anæsthetics would be found most useful agents in aid of other remedies. They cannot be depended upon alone, because pain may be relieved, and the disease still makes its progress; but that relief greatly assists any means which may be used to combat this malady.

General rules for the treatment of puerperal fever can scarcely be laid down, so much depends upon the character of the epidemic and the quantity of the poison absorbed. If the dose be a maximum, it is impossible to save the patient; if in such quantity that the constitution can make an effort to get rid of it, much of our success will depend upon a close observation of the manner in which the effort is made: and it is here that promptitude is attended with so much success. Prompt depletion immediately after a rigor has saved many a patient; emetics, purgatives, diaphoretics, and even diuretics, have proved their value when given with promptitude and decision. Depletion has had the most success, because, in the majority of cases, a rigor is a well-marked and early symptom. If the dose be a minimum, just sufficient to excite peritonitis or phlebitis, the treatment must be directed to subdue these inflammations, and the danger consists in the nature of the tissue inflamed. Such cases are met with in hospitals on the decline of the epidemic, or are scattered through a district on the outskirts, as it were, of the poison.

Those authors who have adopted the term "puerperal fever," have made classifications of its varieties. Tonelle describes the inflammatory, adynamic, ataxic forms; Ferguson, the peritoneal, gastro-enteric, and nervous fevers; Gooch, the inflammatory and typhoid: but these terms only signify degrees in the dose of the poison, not any essential difference in the fever itself; and the remedies to meet these several conditions are successful in proportion as they remove or neutralize the poison absorbed, or support the constitution against its influence.

The prophylaxis of this malady is a question of even more importance than its treatment. The means of arresting its progress, or expelling it from a locality, may save many lives; the best directed treatment has sometimes scarcely saved one life in ten. In this, as in other toxemic diseases, *ventilation* plays an important part; and much of the mischief caused by this scourge has arisen from our ignorance of the principles of ventilation. The continental hospitals are remarkable instances of neglect of these principles; their mortality varies from 1 in 13 to 1 in 20, chiefly in consequence of puerperal fever, the result of imperfect ventilation. Until lately, our own hospitals were liable to a similar objection; but the General Lying-in Hospital in the York-road, built on the marsh of the Thames, is an

evidence of the value of an improved knowledge of this subject. The puerperal fever which so often poisoned its wards is, I believe, now totally expelled.

Another very fertile source for the production of animal poisons is, bad or imperfect drainage, which may baffle the best directed ventilation. *The sewerage* of the metropolis is now becoming the subject of animated discussions; and we have learned that there are a multitude of cesspools carrying on their "fæcal fermentations" with an activity which the best ventilation could not remove. It is not surprising, therefore, that puerperal fever should be found scattered through London, even in houses where one could hardly expect it. It is to be hoped that the attention now given to this subject will be the means of destroying such a source of infection. But something more is required than emptying cesspools. It is equally important that the putrescency removed be not brought back again. Some years ago a part of the Edgeware-road was under repair, and a quantity of Thames mud was laid as a foundation for the pavement. In three days afterwards, five cases of cholera occurred in that district; and if there had been any cases of labour, puerperal fever might as easily have been produced, to spread through the neighbourhood. A law is required to regulate the movements of certain manufacturers, builders, and paviors, lest they undo what the public are endeavouring to accomplish. Nay, we would venture to hint that such a law might be of great value if it prevented a more important personage establishing a gigantic cesspool at Erith, where fæcal fermentations may be carried out on a scale of sufficient magnitude to bring back the plague itself. Several methods have been proposed for overcoming this difficulty, but there is one which, in a medical point of view, I think well worthy of attention. Mr. Dovor has discovered a process of deodorization, which I have witnessed, and have been surprised at the result. By this method the refuse of the most offensive sink has been rendered perfectly devoid of either smell or taste; the stinking sewerage has been converted into water nearly pure, and a residuum perfectly inodorous, but still valuable as manure. The agents employed by Mr. Dovor are hydrochloric acid, proto-sulphate of iron, and chloride of sodium: proto-sulphate of iron, because it is the best salt for fixing ammonia; and chloride of sodium, because of its chlorine. With the same object, Sir William Burnett and Mr. Morell have used concentrated solutions of chloride of zinc as disinfecting agents.

Chlorine is well worthy of attention as a prophylactic; its powers as a disinfectant had been known long before this experimental proof of its efficacy. When Dr. Collins was appointed Master of the Dublin Lying-in Hospital, puerperal fever was rife; he expelled it completely by the extreme strictness with which cleanliness and *chlorine fumigations* were carried out. Each lying-in ward, the moment it was empty, underwent a process of fumigation and cleansing, which con-

tinued for a fortnight, when it was opened again for patients. The result was, that of 10,785 patients delivered in the hospital, only 58 died, which is nearly in the proportion of 1 in 186: the lowest mortality, perhaps, on record in an equal number of a similar class of females.

Dr. Semelweiss has proved its value in the Vienna hospital, where from 250 to 300 women are delivered monthly. The wards are arranged in two divisions. In the first, about thirty medical students and eight midwives attend; in the second division there are twenty-eight midwives, and no students. The mortality in the first division varied from 30 to 70 per month; while that in the second (the midwives' department) was only from 7 to 9 per month. In one year, the mortality in the first division varied from 30 to 70 per month; while in the midwives' department it was only from 4 to 7 per month. In one year the mortality in the first division amounted to 500! while, in the worst period, it did not exceed 40 in the second division. Dr. Semelweiss was at a loss to explain this extraordinary difference; he could not admit superiority of skill in the comparatively ignorant midwives: the only difference he could think of between them was, the dead-room. The students were always making post-mortem examinations; the midwives never entered it. He assumed from these facts that the cadaveric contagion was communicated to the lying-in women, and excited puerperal fever. With this conviction, he employed *chlorine* as a disinfectant. Students in attendance on patients were required not to handle dead animal matter. Those who had done so were not allowed to examine patients until the following day, and, before doing so, were obliged to wash their hands, *and especially their nails*, in a solution of chlorine. Dr. Semelweiss was gratified to find that by this means he arrested the disease; the mortality fell at once to 7 per month, the same as in the midwives' division.

These facts prove that chlorine is not only a deodorizer, but a disinfectant, and suggest some important questions. Is smell a proof of the vitality of a poison? If the smell be removed, is the poison destroyed? Every dissecting-room student knows the tenacity of the cadaveric effluvia. Washing will not remove the smell of his occupation from his hands; he uses every precaution lest his habiliments should betray him; the ammoniacal odour, if he is not cautious, may accompany him in his amusements as well as in his studies; he, therefore, employs every means in his power to avert such a catastrophe: hence the value of chlorine, which Dr. Semelweiss has proved destroys equally the odour and the poison.

Mr. Dovor finds chlorine valuable as a deodorizing agent; and, as it is also used as a disinfectant, we may assume that if putrid effluvia be destroyed, the poison to which it belongs becomes inert. If this view be correct, it has a very important relation to puerperal fever, because it is always accompanied by a peculiar odour. The effluvia of the lying-in ward is well known to those who attend lying-in hospi-

tals; but the odour of puerperal fever is different: it is faintly acid, very difficult to describe, but easily recognised by those who are accustomed to the disease. I believe that it is equally tenacious as the cadaveric odour, and will accompany the practitioner unless he is strictly on his guard against it. Chlorine will destroy this effluvia; does it destroy the poison producing it? If so, may it not be used internally, as well as externally? Hydrochloric acid, chlorate of potash, chloride of sodium, as a purgative, are at least worth a trial. I offer these suggestions with diffidence, because I have not yet had an opportunity of testing them by experiment.

Anæsthetics are agents which seem to have a prophylactic power. Drunkards are less under the influence of poisons, because the susceptibilities of the nervous system being blunted, as it were, by their potations, the activity of the absorbents is proportionately diminished. On this principle, chloroform, so far from being a cause of puerperal fever, seems to me a preventive; and if this scourge were raging in a district, or decimating an hospital, I should certainly take advantage of its power, as a security against the attack.

In the review which has been made of this perplexed subject, the object has been to remove from it what seemed unnecessary difficulties, caused by the terms employed to designate this disease. The correctness of naming it an inflammation of one or other of the tissues engaged was questioned, because such inflammations were only accidents, which may or may not be present, and do not constitute the essential character of the malady. Hence, the correct principle of treatment is, the employment of such means as will remove or destroy a poison, not such as are intended to combat an inflammation.

Lastly. At the present time, when so much attention is given to sanitary measures,—when the old bills of mortality have been succeeded by a most valuable system of registration,—it seems to be a very grave error to call a morbid poison by a wrong name; and if in their returns the profession send in cases of puerperal fever under the names of "peritonitis," "phlebitis," "arthritis," they not only deceive themselves, but the public. Those precautions which are necessary when poisons are present are neglected, because it is believed to be, and is called, a simple inflammation; and it is only when the so-called inflammations are flying from house to house or from bed to bed, that alarm is taken,—just when it is too late. The Registrar General receives a return unintentionally false, and puerperal fever may be raging in a district where the name is never heard: but the period is remarkable, because of the number of post-partum inflammations which have had a fatal termination.—*Dublin Quarterly Journal, Aug.*, 1857, *p.* 23.

100.—*On the Employment of Electricity in the Suppression of the Lacteal Secretion.*—M. Becquerel, in a late communication to the Société Mèdicale des Hôpitaux de Paris, has made some remarks upon

the influence of electricity in restoring the secretion of milk. His attention was called to the subject by a case related to him by M. Aubert, who had employed electricity in the case of a young woman whose milk had been suppressed in consequence of a double pneumonia. The electricity was applied to the breasts by means of moist excitors, and after four applications, each lasting twenty minutes, the lacteal secretion was completely restored. M. Becquerel was at first incredulous as to the reality of the result; but the following case, which fell under his observation, removed his doubts:

A young woman, aged twenty-seven, well formed, although of a nervous temperament, had suckled a young infant for six months, but, on the occasion of some intense and often-repeated mental emotions, the lacteal secretion diminished considerably; the right breast retained a little milk, but the left was almost completely dried up. M. Becquerel applied the electrical current at first to the left breast, placing the moist excitors, made of sponge, successively in the different points of the circumference of the breast, so that the currents might traverse the organ in all directions. Three applications were made, each lasting a quarter of an hour. The patient suffered very little, and indeed experienced little more than a feeling of inconvenience. From the time of the first application, the rush of milk supervened almost immediately after the application of the electrical currents. After the third application, the secretion was full and entire; the child had taken the breast, and the milk was abundant in the left breast, and sufficient in the right to obviate the necessity of applying the electricity on that side.—*British and For. Med.-Chirurgical Review*, *July* 1857, *p.* 234.

101.—DR. GOOLDEN'S ABORTIVE TREATMENT OF MILK ABSCESS.

By E. U. Berry, Esq., Covent Garden.

[The author has found this valuable mode of treatment eminently successful; he gives two cases in illustration. Dr. Goolden's paper will be found at p. 354 of Vol. xxxiv. of this Retrospect.]

Case 1.—M. S——, confined of her first child in December, 1856. According to her reckoning and the appearance of the infant at its birth, the labour was premature. On the third day the breasts were swollen, hard, tender, throbbing, and red: the superficial veins enlarged, with feeling of great distension. The nipples were retracted and cracked, and the child was too feeble to suck, even if the nipples had been more prominent. The milk partially oozed away, and a little was drawn by means of a breast-pump, but not enough to produce any sensible diminution of their bulk; besides which, the abortive efforts were attended with the greatest suffering. There was fever, anxiety of countenance, and depression of mind; as she had a great dread of a "bad breast." This was evidently one of those cases that must inevitably result in abscess, unless something more

than the ordinary remedies were resorted to. I gave directions to paint the areolæ and nipples with extract of belladonna, and to take a saline mixture with half-drachm doses of colchicum every six hours. Upon visiting her on the following day I was as much gratified as surprised at the result of the treatment. The fever had entirely disappeared; the breasts were quite soft; the *milk had flowed away in great abundance* into a bread and water poultice; a cheerful expression of countenance was exchanged for the former one of anxiety and dread; and all apprehension of evil had disappeared. I ordered the mixture to be omitted, but to continue the local application. The case required no further treatment, and she was "about" in the course of a few days.

Case 2.—A. S——, three days after her confinement (January, 1857) began to suffer great pain in the nipples when the child attempted to suck. Shields, unguents, nitrate of silver, were applied, with but temporary relief. At length the agony was so great, that it was determined to abandon all further attempts at suckling. The nipples were deeply ulcerated, and the breasts began to exhibit the usual symptoms of inflammation from lacteal engorgement. I directed the extract of belladonna to be applied, and with the same happy results as in the former case; the bread-and-water poultice being saturated with the escaping secretion, and all inflammatory excitement subsiding in a remarkably short space of time.

In the cases related by Dr. Goolden, the belladonna, with the internal administration of colchicum, appeared to have had the effect of arresting the secretion of the milk. In the cases above detailed it is seen that the milk *flowed away abundantly*, and that the mother was enabled to continue lactation shortly after the application. Its beneficial effect in subduing the inflammation seems to me to admit of an easy explanation. The long-recognised power which this drug is known to possess of relaxing muscular contraction, at once suggests the *modus operandi* in these cases. I do not know if a sphincter has yet been demonstrated at the exit of the lactiferous ducts, but that the ducts are themselves muscular is well known; and the belladonna, by relaxing the muscles (or sphincters, if there be such), allows the cause of the inflammation—the accumulated secretion, to pass away readily, when the inflammatory symptoms and the accompanying fever rapidly subside.

Doubtless, any of the active forms of belladonna would answer the purpose equally well with the extract; such as a solution of its active principle, atropine. I do not, however, think that the choice of the form is altogether a matter of indifference. The latter is undoubtedly more elegant, and I dare say would be more speedy in its effect; but the extract, from its being a messy and unsightly application, is much more likely to be carefully washed off, so as not to be injurious to the infant when replaced at the breast.—*Lancet, June* 6, 1857, *p.* 592.

102.—*Artificial Maternal Milk.*—The following remarks are from an interesting paper lately read at the Harveian Society by Mr. Lobb:—"There are objections besides that of adulteration to the use of cow's milk for infants, although pure.

Constituents of	Maternal milk.	Cow's milk.	Ass's milk.
Caseine or curd	2·02	4·48	1·82
Butter	3·05	3·13	1·11
Lactine or sugar of milk	6·50	4·77	5·08
Salts { Lactate of soda..	45	60	34
Salts { Chloride of potassium			
Salts { Phosphate of lime, iron, &c. ...			
Water	87·98	87·02	90·65
	100·00	100·00	100·00

"In comparing the constituents of these, it will be perceived that the maternal milk contains less than half the amount of curd that is found in cow's milk, and a little more than ass's—a little less butter than cow's, and an excess over the ass's—more sugar than ass's and a good deal more than cow's—the salts do not vary so greatly in amount, and the water a little more than cow's, but considerably less than ass's. By adding two and a half per cent. of cream to ass's milk, a very good substitute for the maternal milk would be procured with great ease, but ass's milk is so expensive in London that it would remove such a preparation entirely beyond the reach of the poor, whom I desire to benefit equally with the affluent. By removing a portion of curd from cow's milk, and adding sugar of milk, a cheap and excellent substitute can be obtained."—*Med. Times and Gazette, July* 25, 1857, *p.* 103.

103.–PROLAPSUS OF THE UTERUS—PLASTIC OPERATION.

By Prof. Fergusson, F.R.S., &c.

[In this case, which occurred at King's College Hospital, there was rather a departure from the usual plan pursued.]

The patient on whom the operation was performed was about forty-five years of age, rather reduced in flesh, in consequence of having suffered severely for about three years from prolapsus of the uterus and bladder of an aggravated character. The organs when down formed a tumour about the size and shape of a large cocoa-nut, which hung down between the thighs. There was considerable hypertrophy of the uterus, and some excoriation was observable on the posterior

part of the neck; the bladder could be distinctly felt on the anterior part of the tumour, just under the pubes.

The patient having been put under the influence of chloroform by Dr. Snow, Mr. Fergusson smeared the surface of the tumour with lard and returned it to its normal position. He then made the usual horse-shoe denudation, and having secured all the arterial branches that appeared to require it, he brought the denuded surfaces together by means of the common interrupted suture, instead of the quill suture which we have hitherto seen him use. The parts were dressed in the usual way, and the patient was then removed to the ward.

Mr. Fergusson remarked, that, having found some inconvenience from the pressure of the quill suture in such cases inducing a disposition to sloughing of the edges of the wound, he had tried the common interrupted suture in a previous case, and found it to answer the purpose perfectly; adhesion had taken place without the slightest difficulty, and in a comparatively short time. It was not easy, he said, to ascertain the exact amount of pressure exerted by the quill suture, and if it was too great it had the effect of strangulating, in some measure, the parts included, and thus producing a disposition to sloughing. The fact also, of being more accustomed to the dressing and management of wounds treated by interrupted suture, might also have some effect in producing the favourable result which had followed it in the case alluded to. It might be thought that there would be some difficulty in bringing the denuded surfaces perfectly together by this suture, but this was not the case; for, although the wound appeared to gape very much as the patient lay on the operating table with the thighs separated, the raw surfaces were easily brought in contact, owing to the great elasticity of the parts, and when the thighs were brought together after the operation, there was not the slightest tension exerted on them, and they could be kept in perfect apposition.

The plan thus adopted greatly simplifies this important operation, which has proved so efficacious in relieving this distressing complaint; and from the success hitherto attending it, in the hands of those who have practised it, there is no doubt it will become very general. He (Mr. Fergusson) had operated on eight cases within a short period, and they had all been perfectly successful; many of them were cases of a severe character, which had rendered the lives of the unfortunate sufferers perfectly miserable.—*Medical Circular, Sept.* 9, 1857, *p.* 128.

104.—REPORT OF A CASE OF VESICO-VAGINAL FISTULA.

By Dr. J. H. Sawyer, Professor of Midwifery to the Original School of Medicine, Peter Street, Dublin.

[The subject of this case was a young woman who had been delivered with Churchill's forceps, the head of the child having remained stationary upwards of nineteen hours. About the fifth day after the operation, incontinence of urine set in. The formation of a vesico-

vaginal fistula was ascertained, but as her general health was impaired, she was directed to try change of air, and return to the hospital after two or three weeks sojourn in the country.]

She was re-admitted on the 1st of July, and, on examination, a transverse oval aperture was ascertained immediately above the neck of the bladder, through the vesico-vaginal septum; it measured eight lines in its long diameter, and the finger could be readily passed into the cavity of the bladder. The narrowed condition of the vagina, combined with the soreness resulting from the extensive excoriation, made the examination very difficult. The patient complained that the moment she turned in the bed, or assumed the erect posture, the urine flowed away. She said her life was miserable, that she was offensive to others, and unable to earn her subsistence, and would gladly submit to any operation. Various attempts were made to relieve the extreme sensibility of the parts. Carbonic acid gas (as suggested by Dr. Simpson) was injected, and the vapour of chloroform, through Dr. Hardy's chloroform bellows; but instead of diminishing the soreness, such aggravated suffering, with increased contraction of vagina, was induced, that I was compelled to postpone the operation from the 15th to the 25th. Two days prior to that date I cautiously dilated the vagina with plugs of prepared sponge, smeared with extract of belladonna, which proved an admirable anæsthetic.

Having previously cleared out the bowels, I secured her in the position for lithotomy, and proceeded to operate in the presence of Drs. Montgomery, M'Clintock, Churchill, Rayland, and Mr. Maurice Collis. It had been intended to use chloroform; but after a few inspirations, the sudden irregularity of the heart's action compelled us to desist. Two dilators were first introduced, and pressed obliquely upwards and outwards. The third pressing down on the recto-vaginal septum enabled me to get a good view of the fistula. A full-sized catheter passed through the urethra, and pressed downwards and forwards, kept firm the posterior margin of the aperture and prevented the bladder from coming in contact with the knife. With a long-handled, double-edged knife I carefully split the vesico-vaginal septum at the posterior lip to the extent of three lines, carrying the knife completely around the commissures, and keeping close to the vesical surface. I then did the same to the lower and anterior margin, but with greater difficulty, as its aspect was turned from me. The constant welling of blood and urine compelled me to work very slowly. I then syringed with cold water, which in some degree repressed the bleeding, and with the ordinary fixed needle, as used in a similar operation by Mr. M. Collis, I inserted four ligatures of strong brown thread at intervals of three lines, carefully avoiding penetrating the vesical mucous membrane. I secured the ligatures over two bars of gutta percha, and was most cautious not to draw the thread too tight, thus preventing the risk of strangulation of the margins enclosed between the quills. The operation lasted about half an hour.

She was then placed in bed on her face, her body well supported by pillows, a long gum-elastic catheter was passed and secured, and one grain of opium was directed to be given every third hour.

On the fourth day, I examined, and was gratified to find the margins of the wound in perfect apposition, and no suppuration. I divided the ligatures, but did not remove them until the following day—that is, the fifth from the operation. The union was complete, but I did not venture to withdraw the catheter or act on the bowels until the eighth, when they were gently moved by a mixture of castor oil and tincture of rhubarb.

On the eighteenth day she was walking about the ward. She said she was able to retain her urine, and her only inconvenience was a tendency to micturate frequently. This gradually subsided, and on the 14th of August she was discharged in perfect health, and is at present in a good situation, and, as she declared to me, as well as ever she was in all her life.

This mode of operating appears to me to possess the following advantages:—

1. Facility of execution.
2. Probability of speedy union by adhesive inflammation.
3. The prominence of the vesical flaps form an admirable barrier to the urine insinuating itself.
4. Comparative freedom from hemorrhage.
5. If it does not succeed, there will be no increase of the fistulous aperture, as after other plans.—*Lancet, Aug.* 22, 1857, *p.* 193.

105.—ON OVARIOTOMY.

By Dr. Clay.

[This paper was read by Dr. Clay before a meeting of the medical profession, in the house of Professor Simpson, of Edinburgh. Dr. Clay has now operated in seventy-nine cases of ovarian tumour, fifty-five of which had been successful, but he was now confident, that operating de novo, from his increased experience, he would not have more than twenty-five per cent. of fatal cases.]

Notwithstanding the frequency with which the operation had now been performed, he considered that there were several questions of interest with reference to ovariotomy that still required solution, and on which there was considerable difficulty experienced in deciding. The question as to the large or small incision was the one to which he would first refer. He thought, with due reference to the opinion of such of his professional brethren who differed from him, that the operation could never succeed so well with the small as with the large incision; the principal objection he had to it was the difficulty which it threw in the way of ascertaining the extent and relations of the adhesions of the tumour, when such existed, besides the limited space

afforded by it for the necessary manipulations. With respect to adhesions, he was not inclined to place so much importance on their presence as a point in deciding the question as to the expediency of operating in any particular case. There was certainly many very obscure points in the diagnosis of adhesions. He would no doubt prefer a mobile tumour for operation; but he had been induced to think so lightly of them, that he did not attend specially to their diagnosis. He had refused many cases on account of adhesions, which he would now have no hesitation in making the subjects of operation, with every prospect of success. If the adhesion was only very slight or recent, no difficulty would be experienced in its detachment; if well organized, he was in the habit of leaving it on the peritoneum, and cutting away the free portion of the sac round it. In many cases, he had cut away large patches of the peritoneum with perfect impunity. He had never any difficulty in diagnosing which ovary was the seat of the disease. In ordinary cases, he secured the pedicle of the tumour with a single ligature; but when it was thicker than the finger, he considered it necessary to *transfix* it with a double ligature. The end of the ligature was always left depending from the lower extremity of the wound. In regard to the contents of the tumour escaping into the abdomen, no bad results had ever attended that occurrence; he never had any hesitation in sponging out the cavity of the peritoneum when rendered necessary;—he thought, indeed, that much had to be learned as to what could be done with the abdomen as regarded its surgical relations. Opium played the chief part in the after-treatment, the principal indication being to keep the bowels locked up for three or four days. The advantages derived from chloroform during the operation had been most apparent, and he could answer for its having had no subsequent bad effect. He usually tapped the tumour three or four days before operating. His objection to repeated tapping for the cure or palliation of the disease was, that that operation ultimately proved fatal. He had not found the tumour recurrent in the same side, but in two instances it had returned in the opposite ovary. Many of his patients have had families subsequently to the operation; the first child after had generally been born prematurely, but there had been no peculiarity in the other labours. He believed that there was an hereditary tendency to the disease. A grandmother, her two daughters, and her grand-daughter, had all been the subjects of ovarian tumour. He had also traced critical days in the recovery; the third or fourth being usually the fatal days.—death generally ensuing from prostration ending in collapse. When patients came to him in the earlier stages of the disease, he always advised them to delay the operation till their symptoms rendered it more necessary. In the Medico-Chirugical Society of Manchester, Dr. Blackwell, who had been present at most of his operations, had said that the cases were not of such long standing, nor of such large size, as was generally held to warrant operative interference. This he denied. In the last forty

cases, the tumours averaged thirty pounds in weight, and one weighed seventy-three pounds and made a good recovery. He had operated on patients at all ages—as early as twelve years, one at sixteen; the two oldest were aged respectively fifty-seven and fifty-eight, and the latter made the best recoveries; but he would not recommend operating beyond that age.—*Edinb. Med. Journal, Oct.* 1857, *p.* 367.

106.—ON THE ENUCLEATION OF UTERINE FIBROUS TUMOURS.

By Jonathan Hutchinson, Esq.

[Operations for the enucleation of uterine tumours, may be divided into enucleations properly so-called, when the tumour is completely removed at the time, and into enucleations by gangrene, when a series of procedures are adopted with the object of exposing, and partially detaching, the growth, in the hope that its death and extrusion might follow. The risk by the two modes is about equal under either, about two thirds of the cases end in recoveries.]

The mode of performing the operation.—Whoever has either witnessed its performance, or read the detailed accounts given in some of the French narratives, will have no difficulty in admitting that the enucleation of a large embedded uterine tumour is an operation which calls into requisition first-rate surgical endowments. In not a few on record it occupied between two and three hours in its performance, and presented such obstacles, that the operators were repeatedly on the point of relinquishing their task. The circumstance that these tumours not unfrequently occur to single women, in whom the vagina is narrow, often adds to the difficulties of the case. It is, of course, impossible to give rules which should be applicable to all; but the following memoranda are the result of much investigation, and a careful perusal of all that has been recorded, and will probably be useful to any one who may contemplate its performance for the first time. 1. To have the tumour well depressed into the pelvis by an assistant. 2. To let the first incisions be very free, and pass deeply down into the tumour, thus not only completely dividing its capsule, but facilitating its bisection, should that afterwards be found requisite. This first incision should be made with a scalpel. In most cases it will be found convenient to pass the knife into the uterine cavity, and then turning its edge on to the tumour, cut downwards, and either forwards or backwards, according as the mass may occupy either the anterior or posterior wall. All experience goes to show that no important hemorrhage is to be feared from this incision, and, if directed in the manner indicated, the whole substance of the tumour will intervene between the knife and the peritoneum. 3. The capsule of the tumour having been opened, its separation should next be effected by means of the finger, or, if needful, by blunt-pointed curved scissors, the finger

being used as a director. 4. The surgeon should be provided for this part of the operation with a set of curved scissors, of various sizes and shapes; one pair at least should be very long indeed. He should also have several pairs of strong and large vulsella, a spatula, a blunt hook, a scoop, and a pair of small midwifery forceps. In several cases the operators appear to have been baffled for want of vulsella of proper size and strength for securely holding the tumour. A strong whipcord ligature, and the various appliances for its use, should be in readiness in case of need. 5. The grand object of the operator, after having separated the tumour from its cyst wall sufficiently to allow of its lower part being seized, is to invert the uterus, and drag that viscus, together with the tumour, to the external parts. If this be accomplished, the main difficulty of the operation, that, namely, of working in a confined space, is overcome, and a speedy conclusion may be effected. To do this, a large vulsellum should be carefully planted in the mass, and traction, at first gentle, afterwards vigorous, must be exerted. The axes of the pelvis must, of course, be carefully observed, and the traction must be steady, and not by jerks. As soon as practicable a second vulsellum must be placed above the first, or, if more convenient, the midwifery forceps may be employed. 6. After eversion has been accomplished, an examination with the finger in the rectum should be made, and the relative position of parts having been duly ascertained, the remaining attachments of the tumour must be cautiously separated. The utmost care must be exercised not to cut into an inverted pouch of peritoneum. 7. It is very possible, if the tumour be a large one, that it will be found convenient, before drawing it down, to cut away a portion or portions, and thus diminish its bulk. 8. It is needless to remark that throughout the utmost patience must be exercised, and as much gentleness as is consistent with the requisite degree of force. 9. The operation complete, the everted uterus must be returned; if needful, a sponge plug should be introduced, and a full dose of opium should be given. 10. The use of ice, of the ergot, and of diffusible stimuli must be resorted to, or not, according as circumstances may require.

After Treatment.—The after-management of these cases must, of course, be conducted on general principles. The writer has, however, to speak in terms of the strongest condemnation of the use of turpentine in that form of low inflammation of the pelvic organs, or peritonæum, which not unfrequently follows. It is more especially indicated if rigors have occurred, or if there be symptoms of impending pyæmia. The dose should be from 20 minims to half a drachm. Should there be abdominal tenderness, turpentine stupes may be usefully resorted to. Opium in full doses is another sheet anchor. Perhaps the symptom of restlessness will be most reliable by which to distinguish the cases most needing this drug. There will be no objection to combining its use with that of turpentine; but in cases in which the patient was sinking into helpless, profound exhaustion, and

no peculiar degree of restlessness was present, the writer would prefer to rely on turpentine.

Enucleation by Inducing Gangrene.—This method, if we count those in which primary enucleation was attempted but could not be effected, and include also those believed to have occurred in Dr. Simpson's practice, has been performed in about 27 cases. Out of these there have been about 13 deaths, 10 recoveries, and 4 incomplete cases, in which either it was known that the whole of the tumour had not come away, or there was a return so soon as to render it highly probable that some part had been left behind. Almost all these were cases in which the tumour was of very large size, and in several the operation was undertaken on account of immediate urgency, and after the patient had been reduced to the very lowest state by hemorrhage. Thus it appears probable that of cases of this class somewhat more than one half may be expected to come safely through the risks incident to the procedure, and rather less than half to result in complete cures. It must be borne in mind that a large majority, indeed almost the whole were out of all possibility of treatment by the primary method. This plan has the recommendation of being an attempt to imitate nature. Although confessedly very infrequent, yet cases have occurred in which fibrous tumours of the womb have sloughed and been extruded from their bed without the assistance of the surgeon. A far more common event than this is for them to become pedunculated and assume the polypoid form without wholly losing their connexions to the uterus, Although but few facts exist in which to ground a positive opinion, yet judging from those which have fallen under our notice, we suspect that the fatality of the cases in which spontaneous extrusion has occurred has been little less than that of those in which it has been induced artificially. The process is one always attended with much constitutional irritation. Although no single operation is required in itself involving much risk, yet, with a large sloughing mass in such an important position, with fetid discharges continuing for several weeks, the patient is kept for a considerable time in constant danger of the development of some fatal complication, in the form of pyæmia, peritonitis, or a low type of inflammation of some of the internal viscera. Repeated, if not almost daily, manipulations are needed, and the increased risk of some contagion, either of erysipelas or pyæmia, being thus conveyed by the surgeon, must not be lost sight of, especially if the patient be an hospital inmate. Then, again, it must be borne in mind that the patient has been reduced by long-continued hemorrhages, and that in all probability her vital organs are already, to some extent, in a state of fatty degeneration, a condition which, under the evil influence of profuse suppuration, is not unlikely to become rapidly advanced to a degree incompatible with continuance of function. These kinds of risks render the operation one which will always be attended with much danger, and we think all will admit that it is one which ought never to be performed in an

hospital ward. A healthy locality, and privacy in a large well-ventilated room, with the undivided attentions of a nurse, should be regarded as essential conditions. With these, and with most persevering attention to every minutiæ in the medical and dietetic management of the patient, it may, perhaps, be reasonably expected that the mortality, even in severe cases, might not exceed a third; but there are certainly no grounds for hoping for a success beyond this.

With regard to the plan of operating, it would appear that the knife possesses great advantages over escharotics. The object is as much as possible to separate the adhesions of the tumour from its cyst, and to thus cut off its vascular supply. Now the effect of the application of escharotics is well known to be to induce the union of subjacent parts, and of this the surgeon not unfrequently avails himself, as in the instance of abscess in the liver, requiring to be opened externally. The dread of hemorrhage from the incisions has been proved by experience to be a chimera, and the prevention of this is, as far as we can see, the only shadow of an advantage which can be claimed for the escharotic plan. By means of a free incision the surgeon may not only divide the capsule thoroughly, but damage the tumour itself, and permit of the finger being employed at the time to accomplish the separation of the cyst wall to as great an extent as practicable. The usefulness of ergot after a free opening has been made, and the certainty of its action in promoting the expulsion of the tumour, is a point on which all observers agree. Whether or not an attempt should be made to accomplish the enucleation of the sloughing mass by the hand within a week or two of the commencement of the treatment, or whether it should rather be left to disintegrate and come away in fragments, is a point which the circumstances of the particular case must decide. Dr. Atlee's experience seems to be that the tumour may be left to disintegrate with very good confidence (provided it have been well exposed and freely cut into) that such result will ensue; and some facts which have fallen under the writer's observation lead him to give full credence to this *à priori* improbable statement. The vitality of many uterine fibroids appears to be very small indeed, and comparatively little interference will often suffice to ensure their death, whilst the manner in which large tumours, when they have once become sloughy, will as it were melt away, is quite astonishing.

What Events may be expected when Fibrous Tumours are not interfered with?—The determination of the feasibility of the enucleation treatment does not rest solely on an accurate estimate of the amount of risk which inevitably attends it. We must consider the other alternatives which are offered us. And here, in truth, is by far the greatest difficulty of the question. If these tumours were always fatal within a short space of time, no one would hesitate to recommend a procedure that offers a fair chance of a complete cure in a proportion of about two-thirds. But we know, on the other hand, that they are of by no means infrequent occurrence, and often cause to their possessors

exceedingly little inconvenience. In cases, too, in which at one period of life, and that often a protracted one, repeated and exhausting hemorrhages have been induced, we know that not infrequently the tumour will either alter its position, diminish in size, or undergo such modification in its relations that the troublesome symptoms cease to occur, and the patient be restored to health. On this point we will quote only the confirmatory testimony of Lisfranc, which is the more valuable because it comes from an ultra-partisan of the operation. After speaking of temporary abatements of symptoms, that surgeon writes: "Il est des personnes plus heureuses; après avoir éprouvé pendant quelques années des douleurs violentes, des pesanteurs fort incommodes, des pertes très-abondantes, beaucoup de troubles dans les fonctions digestives, etc., elles voient ces phénoménes morbides se dissiper; l'embonpoint renaît et même quelquefois la fraîcheur: il existe seulement un peu de fleurs blanches, une légére pesanteur et quelques petites douleurs dans les reins; j'en soigne plusieurs qui portant des matrices énormes et fortement bosselées fournissent depuis dix ou douze ans leur carrière avec les faibles inconvènients que j'ai indiqués; elles semblent promettre de la poursuivre longtemps et peut-être même à l'aide des moyens hygiéniques et de quelques soins thérapeutiques, comme si l'utérus était à l'état sain."—'Clin. Chir. de la Pitié,' Vol. III., p. 16.

Researches in the pathological theatres show us what these changes are, the effects of which we have noticed in the sick room. Uterine tumours are often found contracted, and to a large extent ossified, or lodged in the outer part of the uterine parietes, or even pedunculated into the peritoneal cavity. We might also mention, under the possible events which may obviate the necessity of an operation, that spontaneous enucleation may occur; but, as we have seen above, that the risks attending this process are probably as great as when the surgeon interferes, it need not claim much attention. Thus, then, there are probably but very few cases in which the conscientious surgeon could say to his patient that the chance of recovery without an operation was hopeless. Still, however, that a number of deaths from these tumours does occur is undoubted; and in certain cases the amount of reasonable hope is, it will generally be admitted, very small indeed. While, therefore, the indiscriminate adoption of these operations would be exceedingly unwise and wrong, yet we cannot but think that the reverse is the case under conditions of urgency. It happens very fortunately that those tumours which cause serious symptoms are usually the ones most easily accessible. The proximity of the tumour to the mucous membrane of the uterus or vagina, but especially of the uterus, appears to be the main determining cause of hemorrhage, and just in proportion as it bulges inwards is of course its suitability for enucleation. Tumours of very large size have, on the contrary, usually risen well out of the pelvis, and the symptoms attending them are often comparatively insignificant. Two cases

which well illustrate these remarks, are at present under the treatment of the writer. In the first the tumour is apparently about the size of an infant's head, is lodged in the posterior wall of the uterus, and is wedged in the upper part of the pelvis. The patient, a single woman aged 46, formerly enjoyed excellent health, and was in very comfortable circumstances, being a clever hand at the umbrella trade. The tumour has been known to exist for four years, and during that period she has been reduced to a most feeble state, and wholly incapacitated both for her occupation and for any enjoyment of life. She has now the anæmic, blanched aspect of a patient in the last stage of a malignant disease, and was indeed at one period under care at a certain special hospital, where she was told that her disease was cancer. The feet are often œdematous. The tumour can be easily felt above the pubes, but does not rise high. At present a course of the bromide of potassium is being employed, but repeatedly, during the last year, the propriety of attempting enucleation has been considered, and several consultations have been held. The second case is that of an unmarried woman, aged 30. The tumour is an enormous one, reaching higher than the umbilicus, and distending the abdomen as if in the last week of pregnancy. Yet here the symptoms are comparatively in abeyance. Menstruation is regular and not too profuse, and attacks of hemorrhage occur only at intervals of several months. She is able to follow her occupation as a dressmaker regularly, and suffers very little inconvenience beyond the weight, &c., of the mass. It would, of course, under such circumstances, be madness to think of attempting any surgical treatment.

Conclusions.—We state the following as conclusions, not in any dogmatic or positive sense of the term; they are the impressions arrived at after much careful study of the subject, but further experience may very likely modify some of them;—

1. That surgical interference with interstitial fibrous tumours of the uterus is always attended with very considerable risk, and ought not to be practised except under circumstances of urgency, or when the position of the growth is peculiarly tempting.

2. That when the tumour is not of very large size, and is already partially extruded, the operation is rendered comparatively devoid of danger, and ought to be performed at once.

3. When the tumour is yet wholly imbedded, and even when of large size, the enucleation treatment is yet warrantable, if the patient's life be threatened by hemorrhage.

4. That primary enucleation, where at all easily practicable, is much preferable to the secondary method.

5. That where the tumour is very large, or where found after the incisions to be firmly united to its capsule, the secondary plan should be preferred.

6. That whichever plan it is intended to adopt, the first incision should, excepting under unusual circumstances, be made from within the cavity of the cervix, and should be as free as possible.

7. That the danger of hemorrhage from this incision is very slight indeed.

8. That as much should be done as practicable at the first operation in the way of freeing the tumour from its cyst. Thus if the adhesions be found more loose than had been expected, a primary enucleation may be completed where the slower plan had been proposed.

9. That the after-treatment in cases of primary enucleation should consist in warding off the shock by opiates, in sustaining the strength, and in the free use of stimuli and nutritious diet.

10. That in cases of secondary enucleation the ergot of rye should be administered, so as to keep up vigorous uterine action, that the greatest attention should be paid to sustaining the patient's strength, and to the removal of discharge, and shreds of slough, as fast as formed.

11. That in cases of great exhaustion, and threatened pelvic inflammation, the internal use of turpentine is of great value.

12. That in cases of secondary enucleation the surgeon need not be anxious about the removal of the tumour *en masse*, but may entertain a good confidence, that if it have taken on a sloughy state in its lower part that the death and piecemeal disintegration of the whole will follow.

13. That the "recurrent fibroid" tumours slough away yet more readily after interference than the true fibrous ones, although liable to return after a short interval of health.

14. That after a successful enucleation procedure, complete, though gradual, restoration to good health may be expected.—*Med. Times and Gazette, Aug.* 15, 1857, *p.* 168.

107.—*On a Case of Fibrous Tumour of the Uterus removed by Incision and Enucleation.* By Thomas P. Teale, Esq., Surgeon to the Leeds Infirmary.—[In this case the patient, who was unmarried and had never been pregnant, was in an exhausted and anæmic state from large discharges of blood from the womb.]

On examination, the vagina was found rigid and narrow, except at its upper part, which was distended by a large fibrous tumour. This mass seemed to fill the upper opening of the pelvis. The mouth of the womb was so completely dilated, that it could not be felt.

November 13. The patient being bandaged, and placed in the position as for lithotomy, Mr. Teale applied the long midwifery forceps to the tumour, and having firmly grasped it, proceeded gradually to

bring it beyond the external parts. This process was tedious on account of the rigid condition of the vagina and perineum, but by steady perseverance, and the re-application of the forceps, which had once slipped, the tumour was at length drawn fairly beyond the external parts, bringing along with it the inverted womb. It was now found that the tumour was not pedunculated, but attached by a broad base to the womb, from which organ it received a somewhat dense covering. The distinction between the tumour and the general substance of the womb could be readily perceived by the touch. An incision was now made through the investing membrane round the basal portion of the tumour, not far from its attachment to the womb, after which, the mass was readily detached by enucleation. The inverted condition of the womb was immediately afterwards reduced by the hand passed into the vagina, after which the patient was put to bed, and took an opiate and some hot brandy and water. The separation of the tumour was effected with scarcely any loss of blood.

The tumour measured five inches in length by three in breadth. About one half of its surface was covered with the investing membrane, and the remaining half exhibited the exposed nodulated surfaces of fibrous texture.

November 17. The discharge, which has been slight since the operation, has now ceased to be coloured with blood. The patient feels well, and has scarcely had any pain since the operation.

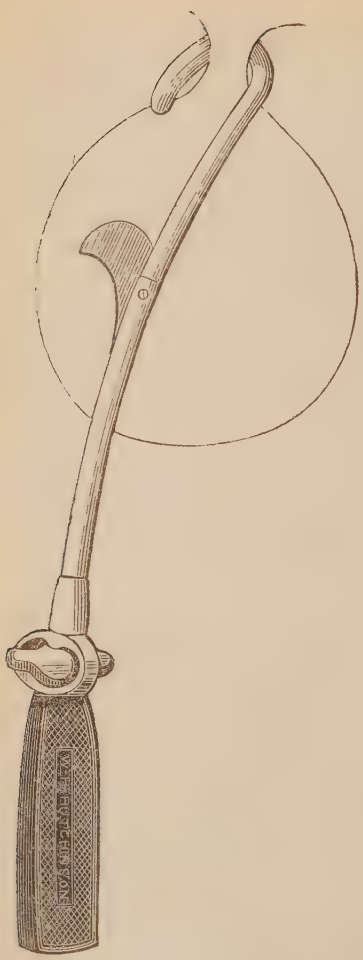
[She was seen seven months after the operation and was in good health.]—*Med. Times and Gazette, Aug.* 1, 1857, *p.* 117.

108.—A NEW INSTRUMENT FOR THE TREATMENT OF UTERINE POLYPI.

By Dr. James H. Aveling.

This instrument consists of a curved stem, at one end of which is a hook. At the other end is a screw, which forces up a plate of metal into the concavity of the hook, in such a way as to *crush* through anything which may be placed in it. A handle fits on the lower end of the stem, the use of which is twofold. First, it enables the operator to have a firm grasp of the instrument while introducing it; secondly, it acts as a key, preventing the whole instrument from revolving with the screw while the plate of metal is being forced up,

The mode of operating with it is simple and easy. Having screwed the plate half-way down the stem, out of the way of the hook, and having fixed on the handle, grasp the instrument with the right hand; then, by the guidance of the left forefinger, glide it gradually into the vagina, and over the polypus, until the hook comes in contact with the peduncle. This may then be readily caught, and the operation concluded by screwing up the metal plate, holding the handle



during this part of the proceeding with the left hand, and screwing with the right.

It is at the option of the operator whether he will use this instrument for the purpose of strangling the neck of the polypus, or for crushing it through at once. Those who prefer the use of the ligature will perhaps be glad to try this instrument, on account of the ease and safety with which it may be used, and the power it gives the operator over the duration of the operation. Those who advocate the immediate removal of uterine polypi by the knife may also be induced to use it from the bloodless character of the wound which it inflicts. Like the ecraseur, it first condenses the tissues, and then divides them. The opinion of the profession upon the proper mode of treating uterine polypi is just now somewhat divided. Those who use the ligature fear the fœtid discharge caused by the putrefaction of the polypus: those who use the knife fear the hemorrhage from the cut surface. Dr. Aveling thinks, that by the use of his instrument both these evils may be obviated. Time alone can prove the truth of his supposition.* —*Med. Times and Gazette, July* 25, 1857, *p.* 90.

* The instrument may be obtained of W. and H. Hutchinson, surgical instrument makers, Norfolk-street, Sheffield.

109.—POLYPUS UTERI REMOVED BY THE ECRASEUR.

By G. M. Humphry, Esq., Surgeon to Addenbrooke's Hospital, Cambridge.

[This case was that of a woman aged 52, much blanched and weakened from a constant discharge from the vagina, which had continued nearly two years.]

Sometimes there was an interval, varying from a week to a month, in which there was no discharge, either white or red: lately, however, the discharge had been constant. It appeared that there was no interval between the cessation of the catamenia and the appearance of this discharge: the duration of this latter must, therefore, be uncertain. No enlargement of the uterus was perceptible above the pubes. In the vagina, a softish leathery-feeling mass, larger than a walnut, was felt hanging through the os uteri. The circle of the latter could be felt clearly on the right side and fore part, the finger not reaching it well in other directions. There was blood in the vagina; and the speculum showed the surface of the polypus to be superficially ulcerated.

April 3rd. When she was under the influence of chloroform, and laid upon her stomach upon the operation table, with the legs hanging down, the vagina was dilated by means of suitable speculum and spatulæ. Mr. Humphry then seized the polypus with the vulsellum, and pulled it down so as to bring its neck through the os uteri, and enable him to pass the chain of the *écraseur* round it, some distance above the expanded portion which projected through the os. It was easily divided by the instrument, with scarcely any hemorrhage; and was brought away. It consisted of the ordinary fibrous structure, covered by a thick layer formed, apparently, by a prolongation of the lining membrane of the uterus. This, which had furnished the blood, was, at the extremity of the polypus, vascular and ulcerated.

April 23rd. No unfavourable symptoms followed. On examination, the os uteri was found natural; there was no trace of polypus. A week after the operation, there was some discharge, of a red colour; but this soon ceased, and there has been no return of it.

Remarks.—There is perhaps no class of affections in which the *écraseur* is likely to prove of more real value than polypus uteri, provided the chain can be applied sufficiently high upon the neck of the tumour. By it would be avoided, to a great extent, the dangers incidental to the ordinary plan of ligaturing the polypus by means of Gooch's canula, such as inflammation of the veins, secondary abscesses, &c., which have so often proved fatal, that the operation of tying a polypus is, with reason, regarded as one of great danger. The risk of hemorrhage, which has constituted the objection to the more speedy removal of the growth by the knife or scissors, as practised by Dupuytren, is also avoided.

The difficulty of passing the chain high enough round the neck of

the polypus, which will prove the objection to this new method, may be often, in great measure, overcome by seizing the polypus with hooks, and dragging it lower down, as was done in this instance. It was a peculiarly favourable case, from the fact of the tumour having already, in part, passed through the os uteri.

It should also be borne in mind that it is not always necessary to remove the whole of a polypus; for, when the expanded portion has been taken away, the part of the neck remaining in the uterus commonly wastes, or, at any rate, gives no further trouble.—*British Med. Journal, May* 16, 1857, *p.* 407.

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MISCELLANEOUS SUBJECTS.

110.—ON THE THERAPEUTICAL USE OF ELECTRICITY BY INDUCTION.

By Dr. J. Althaus.

[Formerly electricity could not be applied to a diseased part without endangering the healthy organs, and sometimes the whole nervous system. By Dr. Duchenne's method, electricity can be localized in one part, without irritating another; Dr. Duchenne has been pleased to call his method "Faradization" consecrating to this method of electrization the name of Faraday, who discovered the important phenomena of induction.]

When the skin and the excitors are perfectly dry, and the epidermis very thick, as it is in many people whose professions expose them to the air and hard work, the two electric currents coming forth from an apparatus of induction reunite themselves on the surface of the epidermis without penetrating the skin. They produce sparks and a special crepitation, but no physiological effect whatever. When dry excitors are put on the skin, where it is sensible to electricity, the one subjected to the experiment feels a superficial sensation coming out of the skin, and varying according to the intensity of the current from simple tickling to the acutest pain. But when the skin and the excitors are wet, neither sparks nor crepitation, nor sensation of heat, are produced, but different phenomena of contractility or sensibility are obtained, according as one acts on a muscle, or on a nerve, or on the surface of a bone. In the last case a very strong pain of quite a peculiar character is produced, and it is not allowable to put wet excitors on the surface of the bones. When the excitors are put on the surface of one muscle, the contraction of this muscle is produced, together with a sensation, which is not peculiar to the skin, but always accompanies the electro-muscular contraction; for instance, when one acts on a muscle laid bare by a wound, and no more covered by the skin. Finally, when the excitors are put on the surface of a nerve, the contraction of all muscles, animated by this nerve, is produced.

There are, therefore, two different modes of electrifying the muscles —either by concentrating the electric action in the nervous plexuses or branches, which communicate their excitation to the muscles animated by them, ("indirect muscular Faradization;") or by directing the excitation on only one muscle, ("direct muscular Faradization.")

In both ways the skin and the excitors must be wet. On the muscles of the trunk and most of the limbs, wet sponges are applied, thrust in metallic cylinders, which are screwed on isolating handles. For limiting the electric power in the muscles of a smaller surface, as the muscles of the face, the interossei and lumbricales, conical metallic excitors are used, which are likewise screwed on isolating handles. These excitors are then covered by wet leather; for example, fingers of gloves.

Indirect muscular Faradization requires exact knowledge of the anatomical position of the nerves. In the arm, the electric power can be limited to the median nerve on the inner and inferior third of the humerus; to the ulnar nerve on the interval between the olecranon and the internal condyle. The radial nerve is accessible to Faradization at the junction of the two upper thirds with the lower third of the humerus; the musculo-cutaneous in the axilla. On the thigh, indirect muscular Faradization is easier. The crural nerve is to be found in the groin, outside of the femoral artery; the two popliteal nerves in the popliteal space. The sciatic nerve is only accessible to Faradization on its origin in the pelvis, through the posterior wall of the rectum.

In the other parts of the body indirect muscular Faradization becomes difficult and delicate. On the face, the trunk of the seventh pair, covered by the parotid gland, is inaccessible to electricity, whatever may be the intensity of the current. But it can be reached, where it passes out of the stylo-mastoid foramen; here an excitor is to be placed in the external opening of the ear; in this point the nervous trunk is separated from the excitor only three or four millimetres. Its branches may be excited at the points where they emerge from the parotid gland. Contraction of the muscles being under control of these branches, is the certain signal of their electric excitation.

In the supra-clavicular region, the excitors, placed immediately over the collar-bone, act on the brachial plexus. On the summit of the supra-clavicular triangle they are in connexion with the external branch of the eleventh pair. This nerve, the respiratory nerve of Bell, is the most excitable of all the nerves of the human body. The lower half of the sterno-cleido-mastoid and the trapezius are very little excitable. But when a very feeble current is directed on the upper half of the sterno-cleido-mastoid, or on the external border of the upper half of the trapezius—a current, indeed, which would not be expected to produce any movement in the muscles at all—the head is strongly inclined to the side acted upon, and the shoulder drawn up by a violent and sudden movement.

The muscles, like the nerves, do not all possess the same degree of excitability. If they did so, muscular Faradization would be very easy. Now, however, it is necessary to measure the electric dose for the different muscles, only rightly to be done when the operator is guided by a long experience. The electro-muscular sensibility—viz.,

the sensation produced by the electro-muscular contraction, is very different likewise in the different muscles. Some muscles are so extremely sensible, that Faradization is occasionally impracticable. Electro-muscular sensibility is very lively in the muscles of the face, due to the ramifications of the fifth pair, which excite these muscles. It is important to avoid always the points corresponding to the infra-orbital and submental nerves, the excitation of which gives a very painful sensation. The most excitable muscles of the face are the frontal muscle and the orbicularis palpebrarum; the least so, the buccinator and the masseter. On the neck, the platysma myoides is just as excitable as the upper half of the sterno-cleido-mastoid and the external border of the upper half of the trapezius. The most excitable muscles of the trunk are the pectoralis major and the muscles of the fossa infra-spinata, chiefly the rhomboidei; then follow the deltoid and the muscles of the arm. The anterior are much more excitable than the posterior muscles of the extremities. The most excitable muscle of the leg is the tensor vaginæ femoris.

It is quite certain that sufficiently wet excitors, in perfect contact with the skin, give rise to *muscular* sensation only; but at the moment when it is applied to the skin, and before the contact is perfectly established, a *cutaneous* sensation is mixed with the muscular sensation. Therefore muscular Faradization chiefly when applied by rapid intermissions, is much more painful at the moment when the excitors are applied to the skin. It is easy to spare this sensation to the patient. Before putting the excitors on the skin, one approaches them, so that they touch each other, and the current is neutralized. Then, when they are in perfect contact with the skin, remove the one from the other, so that the electric recomposition is effected in the muscle to be excited.

Many interesting facts have been evolved from the application of electricity to the study of the functions of the muscles of the living body. It is become possible to create so, a kind of living anatomy. It is true that the deep strata of the muscles, covered by the superficial ones, will not clearly exhibit their contraction. But here pathology has seconded physiology. It is chiefly muscular atrophy, terminating in fatty degeneration of the muscles, that, by destroying the superficial muscles, takes away the impediments to the electric current, and thus helps to the knowledge of the function of every muscle in the living body. Many of the theories on the functions of the muscles formerly adopted have thereby fallen to the ground. As one of the most remarkable facts now established, I only suggest, that the muscle extensor communis digitorum has no influence whatever on the extension of the second and third phalanges, but only on the first; that it is, in fact, the little lumbricales and the interossei that extend the second and third phalanges, and bend the first. Also, that the muscles, flexor sublimis and profundis, bend the second and third phalanges, but not the first. This is con-

firmed by many pathological facts, chiefly on lead-paralysis and fatty degeneration of the muscles. In lead-paralysis, the extensor digitorum is paralysed, but not the lumbricales and interossei. Therefore, in lead-paralysis, the power of extension of the second and third phalanges remains in all its integrity; only the first phalanges cannot be extended. On the other hand, when the extensor digitorum is not paralysed at all, sometimes the hand has the form of a claw, the interosseous spaces are deeply hollowed, the hand is very thin; the first phalanges are extended, but the second and the third are bent. This condition of the hand is due to paralysis and atrophy of the lumbricales and the interossei, and is often cured by Faradization of the named muscles.

Dr. Duchenne has given a special study to the function of the muscles of the face, to know the mechanism of the physiognomical expressions. It is true, that although these muscles have a very small surface only, electricity can be localized in every one, so as to produce isolated contractions. The way to show most clearly the part every muscle takes in the different physiognomical expressions is, to electrify the muscles of the face of a man who has just died, and whose muscles have yet retained their irritability; for the living man, when electrified, always mixes involuntary movements, not connected with the contraction of the electrified muscle, an impediment, of course, to the observation of the individual action of the muscles. It is, indeed, very interesting to see on a dead body all physiognomical expressions produced, for it is only the muscles which are put into action by thoughts, passions, and character; they preserve, during the muscular repose, the predominance of tonic force, and stamp on every physiognomy its peculiar impression. If there was not in every face tonic predominance of this or that muscle, all physiognomies would be like each other, as the muscles have the same direction, attachments, and strength, and the bones only differ from each other by their volume. So the frontal muscle, when slightly contracted, cheers up the face; more contracted, it expresses doubt, surprise; in the highest degree of contraction, and united with some other muscles, it gives the expression of an agreeable surprise or of terror; it also wrinkles the forehead, and when paralysed, the wrinkles disappear.

The pyramidales nasi, which are in intimate relation with the frontal muscle, and therefore considered by many anatomists as only one muscle with the frontal, in their physiognomical action too, nevertheless are the antagonists of the frontal muscle; they give a sad expression, and, when more contracted, a threatening one. It forms a striking contrast to see these two opposite movements produced in so small a space as the level of the eyebrows.

Isolated contraction of the orbicularis palpebraum and corrugator supercilii expresses reflection: united to the pyramidalis, they express malice. The platysma myoides gives the expression of pain; united

with the frontal muscle, it expresses terror: and, with the pyramidalis, rage. Contraction of the triangularis nasi gives the expression of lust. The zygomaticus major always expresses mirth, from simple smiling to the most extravagant hilarity; united with the frontalis, it gives the expression of an agreeable surprise; with the platysma myoides, the sardonic laugh. The zygomaticus minor, on the contrary, gives the melancholy air. The levator alæ nasi and labri superioris is the real weeping muscle of children, and produces a very ugly grimace. By the contraction of the external fibres of the orbicularis oris, the lips are everted forward, as for kissing and whistling; the internal fibres apply the lips against the teeth, as is done, for instance, by players of the clarionet for pinching the reed of their instrument between the lips. The levator menti is the only muscle in action in persons who repeat their prayers inaudibly in Catholic churches. The triangularis oris expresses sadness; in children it is the precursor of tears; in the maximum of its contraction it expresses disgust.

As electricity is able to produce muscular contractions without injuring either the skin or the muscles themselves, it may be applied, when muscular contractility is weakened or lost—namely, in muscular paralysis, whether resulting from wounds of the nerves, or from lead-poisoning, or by hemorrhage into the brain, by rheumatism, by hysterics; in paraplegia; finally, in progressive atrophy of the muscles which terminates in their fatty degeneration.

I now proceed to an exposition of the method of electrifying the skin. Faradization of the skin is to be practised by means of dry excitors applied to the dry skin, and by the current of the second order; it is capable of exciting, in the highest degree, the sensibility of the nerves of the skin, without ever destroying the skin itself. Only when it is practised by the strongest current and the strongest excitors, and in persons whose skin is very delicate, a little erythema sometimes follows, which, however, very soon ceases; but never anything like inflammation or gangrene, such as is produced by galvanism.

As the different parts of the body have various degrees of sensibility, there must be different processes for cutaneous Faradization. There are, however, three principal processes, which, united with the regulation of the current by the tube of water and the copper cylinder, seem to fulfil all the conditions required.

The first process is Faradization by the electric hand. A wet excitor, which communicates with one of the poles of the apparatus, is placed on a point of the body of the patient, which is very little excitable, for example, in the inner surface of the hand; the other excitor, united with the other pole, is kept in the hand of the operator. After having dried the skin of the patient by the application of a little rice powder, the operator passes rapidly the back of his disengaged hand over the points to be excited. The application of the electric hand produces on the face, under the influence of a somewhat strong current, a lively sensation; but on the other parts of the body

it evolves a sensation hardly perceptible. Lively crepitation, produced by the rapid passage of the hand over the skin, is there the only appreciable phenomenon ; electricity is heard, but not felt. By strengthening the intensity of the current. there can be produced more violent sensations.

The second proceeding of cutaneous Faradization is exercised by *solid metallic excitors*, which are screwed on isolating handles. The skin must be dry as before ; but if the epidermis be too thick or hard, as on the hands and feet of many persons, the skin must be moistened a little, in order that electricity may pass through the thickness of the skin. When it is necessary to exercise a very strong impression in a certain point, the excitors are held some time in contact with the skin. When sensibility is normal, this gives a sensation as if a red-hot nail were thrust into the skin. It can be applied chiefly near the vertebral column. The solid metallic excitors, though acting energetically on the skin of the face and of the trunk, are often insufficient on the hands and on the soles of the feet, whatever may be the intensity of the current.

For such cases *metallic wires* are employed in the shape of brushes, thrust in metallic cylinders, which are screwed on isolating handles. The skin is to be lightly beaten by these wires. but sometimes it may be necessary to leave them longer in contact with it ; the sensation produced by it is stronger than that produced by red-hot iron, according to the patients who have tried both.

I have already mentioned the exquisite sensibility of the skin of the face, due to the ramifications of the fifth pair. The most feeble current of induction exercises here an effect which is by no means felt in the other parts of the body. Sensibility is much stronger near the middle line of the face than far from it—namely, in the eyelids, the nose, and the chin, than on the cheeks. Electric excitation is more strongly felt in the nostrils than in any other point of the body. On the forehead there is not so much sensibility as on the face, and very little on the scalp. It is more exquisite on the neck and on the trunk than on the extremities; more in the cervical and lumbar region than on the other parts of the trunk ; more on the inner and anterior surface of the extremities than on the external and posterior parts. The skin of the hands and of the soles of the feet can only be stimulated in a lively manner by an intense current and strong excitors.

Faradization of the skin is useful in both exalted and dejected states of the sensory nerves—viz., in anæsthesia and neuralgia; as tic douloureux, irritable breast, sciatica; in which diseases the most wonderful results have been obtained, after all other treatment had proved unsuccessful. The same can be said of muscular rheumatism, the entire removal of which, after some applications, may be fairly reckoned upon. This applies also to protracted cases, where leeches, cuppings, vesications, morphium, Russian vapour-baths, and hydropathy, have been used with little or no success.

Finally, a few words upon Faradization of the internal organs. The tympanum has been electrified with success in nervous deafness. The meatus auditorius externus is to be filled with water; a metallic excitor is then kept in the fluid, and the current is closed by putting the other wet excitor on the nape of the neck. The excitability of tympanum is very great, and therefore only a feeble current and distant intermissions are allowable. At the moment the current is closed, the one subjected to the experience hears a little noise like scratching; the more rapid the intermissions are given, the more the noises approach each other, and they now imitate the buzzing of a fly on the window. This proves that the tympanum is affected; besides when the intensity of the current is increased, tickling and even pain is produced, together with a metallic sensation of taste in the tongue. This is impossible without excitation of the chorda tympani. As I have already stated, many cases of nervous deafness, which often result only from relaxation of the tympanum, have been cured by Faradization.

The same is to be said on the sense of smell. A wet excitor having been placed on the nape of the neck, the second is conducted on all points of the Schneiderian membrane. It has often been enough to excite very slightly the general sensibility of the mucous membrane of the nose, to call back the lost or weakened smell. For exciting the nerves of taste, metallic excitors are conducted on the edges of the tongue and on the palate. For exciting the retina, as in amaurosis without changes of structure, galvanism may be used, or the current of the second order of an apparatus of induction, applied by means of wet excitors to the eyelids, or on any other part of the face.

Faradization of the rectum and of the muscles of the anus has been used for the cure of involuntary stools and prolapsus of the rectum; as they are often produced by paralysis of the sphincter and levator ani. Then a metallic excitor, the end of which has the form of an olive, being isolated by caoutchouc, is introduced into the rectum, and put into communication with one of the poles of the apparatus of induction; the other wet excitor is applied near the anus. Previous to this operation the rectum must be always cleared from stercoral matters by means of clysters. The margin of the rectum is so very sensible to the electric excitation, that the feeblest current applied to it excites an unbearable tenesmus. Therefore, if it is not necessary to act on the sphincter ani, the excitor must always be isolated.

Faradization of the bladder has always been done in paralysis of the bladder, which complicates paraplegia. To that end the "double excitor of the bladder" is used by Dr. Duchenne. It is composed by two flexible metallic wires, introduced into a sound of caoutchouc with double channel, isolating the one from the other. The two excitors are on that end which is to be put into the bladder, so termi-

nated that when being approached to each other they present the form of an ordinary catheter. The excitor of the bladder thus closed and introduced into it, its wires are driven on about one or two inches, whilst the caoutchouc-sound remains on its place, so that the ends of the excitor are removed from each other. Then the two wires are put in communication with the two poles of the apparatus of induction, and conducted on all the points of the inner surface of the bladder. But it often has been enough to electrify only the muscles of the abdomen for restoring the emission of the urine, as also the constipation so often connected with paraplegia.

The muscles of the pharynx can also be excited, and when paralysed may be beneficially affected. The excitor to be applied differs in no way from that which is used to stimulate the rectum. It is conducted on the pharynx, whilst the other wet excitor is placed on the nape of the neck. It is, however, necessary to avoid the excitation of the sides of the pharynx, as they are in relation with the ninth, the tenth, and the eleventh pairs. If they should be excited, Faradization would be no longer confined to the pharynx, but extended to organs the stimulation of which would be dangerous.

Faradization of the larynx has been done with success in some cases of aphonia, produced by paralysis of the muscles of the larynx. The larynx can be excited directly or indirectly. The method for direct excitation is the following:—The excitor of the pharynx is inserted in the pharynx as low down as the posterior and inferior part of the larynx. The second wet excitor being placed outside, in the level of the crico-thyroid muscle, the former is conducted on the posterior surface of the larynx downwards and upwards, and *vice versâ*. Indirect Faradization of the larynx is much easier:—The excitor is directed on the sides of the inferior constrictor to reach the inferior laryngeal nerve, animating all the inner muscles of the larynx; whilst the other wet excitor is placed on the nape of the neck.

Direct Faradization of the heart and the lungs, the stomach and the liver, is not possible; but stomach, lungs, and heart may be excited indirectly by Faradization of the tenth pair, accessible through the pharynx and œsophagus. These operations seem, however, to be dangerous and not useful, so that a conscientious physician will seldom, if ever, consent to employ them.

I conclude with a few words about the electric excitation of the diaphragm, easily to be produced by Faradization of the phrenic nerve, which, taking its rise from the third, fourth, and fifth cervical pairs, proceeds downwards and inwards in front of the scalenus anticus, before it reaches the mediastinum and the diaphragm. On the anterior surface of the scalenus anticus the phrenic nerve may be easily excited. Excitors with large surfaces, viz., sponges thrust in metallic cylinders, are kept on the point alluded to, and instantly the artificial respiration is produced; the thorax is expanded, and the air rushes into the lungs with considerable noise. So it is possible to maintain

respiration in a body even some time after death; and it may be easily conceived how important this agent may become in asphyxia, whether it be produced by charcoal fumes, by opium, by chloroform, or by cholera. In all these cases the first indication is, to induce respiration, which is often to save life.—*Lancet, Aug.* 22, 1857, *p.* 187.

111.—*On the Solvent Property of Glycerine.* By A. F. Haselden, Esq.—Extensively employed as glycerine is for many external purposes, the value of it as a solvent or menstruum is not, I believe, so generally and fully known, or so justly appreciated, as it deserves to be; and a few remarks, the result of personal practical observation and experiment, may not be altogether without interest to a portion of your readers, particularly those who are desirous of turning to the best account any suggestion likely to add to the comfort or relief of their suffering patients.

The especial property which glycerine possesses of dissolving the disulphate of quinine would alone be sufficient to render it an object of interest, but it is equally powerful with many other substances. It readily dissolves the disulphate of quinine in the proportion of two grains to the fluid drachm, forming at first an opaque fluid, which in the course of a few hours becomes a clear bright solution, possessing the peculiar pale-blue superficial tint peculiar to the solutions of that substance, and this without the aid of heat or any acid. This solution is miscible with waters and tinctures in various proportions, and it appears a great advantage to possess a clear, bright, elegant, and by no means disagreeable solution of the disulphate of quinine, without the addition of acid. Gallic acid, which requires one hundred parts of cold water for its solution, is soluble in rather less than twelve parts of glycerine, making a clear, straw-coloured liquid, of a pleasant, sweetish, sub-acid taste, in this state offering a desirable mode of administering the gallic acid where pills might be objectionable, and a large quantity of fluid impracticable.

Tannic acid is also freely soluble in this substance, and as an external astringent application might prove preferable in many instances to an oily or greasy compound. In the treatment of hemorrhoidal affections, it may possibly offer, as an application combined with opium or the salts of morphia, some advantage over the reigning preparation—unguentum gallæ compositum, it being more tenacious and at the same time lubricating, and when combined with the salts of morphia, in place of opium, it possesses the decided advantage of not staining the linen.

The hydrochlorate and acetate of morphia are readily soluble in glycerine, making a clear, limpid solution of a slightly yellow tinge, forming, as it were, a kind of syrup, which might possibly prove in many ways useful in the hands of the profession.

Glycerine also dissolves the ferri et quinæ citras, in the proportion of

five grains to the drachm, forming an olive-yellow-coloured liquid peculiar to the solutions of that salt.

There are other substances which glycerine eminently possesses the property of dissolving in a larger proportion than any other known fluid, but sufficient has been said to introduce the subject to your readers.—*Lancet, Aug.* 15, 1857, *p.* 179.

112.—*Pyrophosphate of Iron.*—Messrs. Follet and Baume, writing to the 'Gazette Hebdomadaire de Médecine' of May 29, call attention to the advantages of the pyrophosphate of iron and soda as a remedy in anæmia, and the diseases of which that condition is a symptom, or with which it is coincident. They state that, in 1849, Dr. Leras presented to the Academy of Sciences a work on "The action of the Gastric Juice on the preparations of Iron employed in therapeutics;" and that in 1855 he presented to the Academy of Medicine a memoir, in which he expressed the following opinions:

"1. The ferruginous preparations employed in therapeutics are all more or less precipitated, or transformed into oxide of iron in the stomach.

"2. The pyrophosphate of iron and soda is an exception.

"3. This salt seems destined to take a place among the most efficacious preparations of iron."

Dr. Leras prevailed on several medical men to try on their patients a solution of pyrophosphate of iron and soda, prepared by himself, and the results have just been published by Messrs. Follet and Baume in "A Report on the Clinical Service at the Asylum of St. Athanasius during the year 1856." They say that even in cases where there is no longer any hope of curing the mental maladies, there may still be a means of retarding the physical decline, which supervenes in almost all the patients in the same form, by a gradual failure of general innervation,—a decline which is shown frequently in the decomposition of the blood, from which result those dropsies which are met with in all the tissues. In such cases, all the efforts of medication ought to be directed to the reconstitution of the blood, and when this result is obtained, it is not unfrequently seen that the system recommences its functions,—a reaction in the inverse direction of the disease sometimes taking place: it is the prelude of an unexpected cure.

Messrs. Follet and Baume know no tonics which act so promptly and favourably as the pyrophosphate of iron and soda, prepared by M. Leras, in a liquid form; it is easy to administer, rapidly absorbed, and does not produce fatigue to the digestive organs. They then give the particulars of seven cases in which the medicine was tried during the year 1856: the results are certainly remarkable.—*British Medical Journal, Aug.* 1, 1857, *p.* 644.

113.—ON THE ASPHYXIA OF SUBMERSION.

By A. T. H. Waters, Surgeon to the North Dispensary, Liverpool.

A series of experiments, of which a Table is given below, was instituted, chiefly with the view of investigating the two following points, viz.:—

1st. How long the heart continues to beat in asphyxia, produced by submersion.

2nd. What effects the hot bath produces on an animal asphyxiated by submersion.

It is obviously very difficult to come to anything like a correct conclusion with reference to the first point; as far as man is concerned, it is impossible to do so, and even with regard to the lower animals, it is very difficult; a large number of experiments becomes necessary in order to obtain an approximation to the truth. The principle generally admitted is, that "in asphyxia the movements of the heart cease in a few minutes after the cessation of the functions of animal life;" but the occurrence of certain facts, such as the recovery of individuals who have been under water for fifteen minutes and even upwards, would lead us to doubt the truth of it. The second point seems more easily ascertainable, but yet no direct experiments seem to have been performed to ascertain the exact effects produced by the hot bath on the system, when asphyxiated by drowning.

The experiments given in the Table below were performed on warm-blooded animals, dogs and rabbits, and were conducted in the following manner:—The animals were plunged into water at the temperature of the atmosphere, which varied from 40° to 50° Fahr.; they were kept completely under water from the time of their submersion, and when removed, were either at once, or after the lapse of a stated time, opened by the removal of a portion of the anterior wall of the thorax. The movements of the heart were thus observed, without the pericardium being disturbed. Some of the experiments, viz., 9 and 10, 11 and 12, 14 and 15, and 17 and 18, were parallel experiments, *i.e.*, the two animals of each experiment were of the same age and size, were submitted to exactly the same process of drowning, and were opened at as near as possible the same time; the difference between the two being, that one was put into the hot-bath for the period mentioned; the other was left on the table, exposed to the atmosphere during the same time.

Of the eighteen experiments, two must be set aside in analysing them with reference to the duration of the action of the heart, inasmuch as in them the thorax was not opened till after the lapse of an hour from the period of submersion; these are Nos. 14 and 15. Out of the sixteen remaining, in ten the heart was found beating when first observed; in six it had ceased.

Of the ten, No. 1 must be omitted in calculating the average, inasmuch as the heart was removed whilst in action; the remaining nine

give an average of twenty-six minutes, *during which the ventricles of the heart continued to contract;* and if we allow nine minutes as the average of the six, which, on being examined, were found not contracting, we have a general average of nineteen minutes for the fifteen. These conclusions do not coincide with those of Mr. Erichsen, who experimented chiefly on dogs, by producing asphyxia in the open air; he gives an average of nine minutes and a half.

No.	Animal.	Time kept under water	Put into hot bath at 100° and how long.	Period after submersion at which thorax was opened.	Period after submersion up to which the ventricles of the heart continued to contract
1	A rabbit	4 minutes	No	5th minute	11th minute, removed whilst contracting.
2	„	6 „	No	7th „	25th minute
3	„	12 „	No	13th „	35th „
4	„	20 „	No	21st „	26th „
5	„	31 „	No	32nd „	Had ceased to beat when opened
6	Large dog	14 „	No	17th „	„ „
7	A rabbit	11 „	No	12th „	16th minute
8	A dog	8 „	No	9th „	34th „
9	A rabbit	5 „	Yes—5 min.	10th „	20th „
10	„	5 „	No	11th „	Had ceased to beat when opened
11	„	6 „	Yes—4 min.	10th „	30th minute
12	„	6 „	No	12th „	30th „
13	„	8 „	Yes—5 min.	13th „	Had ceased to beat when opened
14	„	10 „	Yes—5 min.	60th „	„ „
15	„	10 „	No	60th „	„ „
16	A dog	8 „	Yes—5 min.	15th „	„ „
17	A rabbit	6½ „	Yes—5 min.	12th „	18th minute
18	„	6½ „	No	13th „	Had ceased to beat.

The chief morbid appearances observed in the animals not put into the hot bath, differed in some important points from those found in the animals which were so treated. In the former, the colour of the lungs was but little altered, their large vessels were not much distended, their substance was less crepitant than natural, and they contained a large quantity of serous fluid. The right side of the heart and the pulmonary artery were much distended, and the left ventricle and auricle contained a small quantity of blood. The blood was black and fluid throughout the body, but coagulated when removed from the vessels. The arteries contained a small quantity of blood. On opening a pulmonary vein, or one of the large systemic veins, a considerable

flow of blood always took place. It was observed during the examination of the animals, that, whilst the heart was beating, and even after it had ceased to beat, on dividing a pulmonary vein, blood flowed and continued to flow for a long time, and that the distension of the cavities of the right side of the heart became much diminished, the blood flowing freely through the vessels of the lungs.

Of the animals submitted to the influence of the hot-bath, the general results were as follows:—The lungs were much more discoloured than when the bath was not used; their large vessels were more distended, and their substance firmer and heavier; the left side of the heart was loaded with blood as well as the right. In some instances, the blood was coagulated in the vessels of the lungs, in the systemic veins and in the cavities of the heart, and in all there was more or less of this condition observed. When a vein was opened, the flow of blood was often arrested by the presence of coagula, and was very rarely free.

In no instance did the hot-bath produce a respiratory effort.

From the above experiments the following deductions are made:—

1. That in dogs and rabbits, when asphyxiated by submersion, the ventricles of the heart do not as a rule cease to contract "in a few minutes after the cessation of the functions of animal life;" but that in many instances their action continues for a very considerable period, and that in all probability the same remark applies to man, and serves to explain how recovery has taken place after lengthened submersion.

2. That the effects of the hot-bath are, to produce great congestion of the lungs, and a tendency to coagulate, in the blood; its use becomes thus *directly* prejudicial; that it does not excite respiratory efforts, and prevents artificial respiration being properly carried out; and it becomes thus *indirectly* prejudicial.

With reference to the treatment of asphyxia, from whatever cause, all our efforts should be made to excite respiratory movements, and if these movements can be produced before the heart has ceased to beat, there is great probability of animation being restored; and even should the action of the heart have ceased, it is *possible* that by re-exciting respiration we may reproduce the circulation.

In attempting to produce artificial respiration the best method is that recommended by Marshall Hall. Experiments on the dead body, and numerous instances of recovery from asphyxia, attest its value, and prove it to be the most simple and efficacious means we know of. If artificial respiration be attempted when the body is supine, the tongue should be drawn forwards and kept so; this has not been sufficiently attended to.

The rules for restoring suspended animation recommended by the Humane Society are defective. Their object is to restore circulation and warmth by means of the hot bath and hot air, neglecting or only imperfectly carrying out, artificial respiration, on which alone safety depends. Moreover, the directions involve very serious loss of time.

Few, if any instances, are recorded by these societies, in which animation has been restored by the means recommended after a submersion of more than five minutes—a fact not to be wondered at when we consider what these means are.—*Liverpool Medico-Chirurgical Journal, July* 1857, *p.* 253.

114.—RESTORATION OF PERSONS APPARENTLY DROWNED.

Royal Humane Society's Instructions:—

Send quickly for Medical Assistance.—*Cautions.*—1. Lose no time. 2. Avoid all rough usage. 3. Never hold up the body by the feet. 4. Nor roll the body on casks. 5. Nor rub the body with salt or spirits. 6. Nor inject tobacco smoke nor infusion of tobacco. I. Convey the body carefully, on its face, with the head and shoulders supported in a raised position, to the nearest house. II. Strip the body, and rub it dry; then wrap it in hot blankets, and place it in a warm bed, in a warm chamber free from smoke. III. Wipe and cleanse the mouth and nostrils. IV. In order to restore the natural heat of the body: Move a heated covered warming-pan over the back and spine. Put bladders or bottles of hot water, or heated bricks, to the pit of the stomach, the arm-pits, between the thighs, and to the soles of the feet. Foment the body with hot flannels. Rub the body briskly with the hand; do not, however, suspend the use of the other means at the same time, but, if possible, immerse the body in a warm bath at blood heat, or 100° of the thermometer, as this is preferable to the other means for restoring warmth. V. Volatile salts or hartshorn to be passed occasionally to and fro under the nostrils. VI. No more persons to be admitted into the room than are absolutely necessary.

If apparently Dead from intense Cold.—Rub the body with snow, ice, or cold water. Restore warmth by slow degrees, and after some time, if necessary, employ the means recommended for the apparently drowned. In these accidents it is highly dangerous to apply heat too early.

General Observations.—On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing be returned, small quantities of wine, or diluted brandy, warm. The patient should be kept in bed, and a disposition to sleep encouraged, except in cases of apoplexy, intoxication, and coup-de-soleil. Great care is requisite to maintain the restored vital actions, and at the same time to prevent undue excitement.

The *Treatment* recommended by the Society to be persevered in for *three* or *four* hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, cases having come under the notice of the Society of successful results even after five hours; and it is also absurd to suppose that a body must not

be meddled with or removed without the previous permission of a Coroner.

DR. MARSHALL HALL'S INSTRUCTIONS:—

1. Treat the patient instantly, on the spot, in the open air, exposing the face and chest to the breeze (except in severe weather).

I.—*To clear the Throat.*—2. Place the patient gently on the face, with one wrist under the forehead [all fluids and the tongue itself then fall forwards, leaving the entrance into the windpipe free.] If there be breathing wait and watch; if not, or if it fail—

II.—*To excite Respiration.*—3. Turn the patient well and instantly on his side, and 4. Excite the nostrils with snuff, or the throat with a feather, &c., and dash cold water on the face previously rubbed warm. If there be no success, lose not a moment, but instantly—

III.—*To imitate Respiration.*—5. Replace the patient on his face, raising and supporting the chest well on a folded coat or other article of dress. 6. Turn the body very gently on the side, and a little beyond, and then briskly on the face, alternately, repeating these measures deliberately, efficiently, and perseveringly fifteen times in the minute, occasionally varying the side [when the patient reposes on the chest this cavity is compressed by the weight of the body, and expiration takes place; when he is turned on the side, this pressure is removed, and inspiration occurs.] 7. When the prone position is resumed, make equable but efficient pressure, with brisk movement, along the back of the chest, removing it immediately before rotation on the side [the first measure augments the expiration, the second commences inspiration.]

The result is—respiration, and, if not too late, life.

IV.—*To induce Circulation and Warmth.*—8. Meantime rub the limbs upwards, with firm grasping pressure and with energy, using handkerchiefs, &c. [by this measure the blood is propelled along the veins towards the heart]. 9. Let the limbs be thus warmed and dried, and then clothed, the bystanders supplying the requisite garments. 10. Avoid the continuous warm bath, and the position on or inclined to the back.—*Med. Times and Gazette, June* 13, 1857, *p.* 605.

115.—ON EXCITATION AND FRICTION, AS AIDS TO MEDICINE.

By Dr. JOHN W. F. BLUNDELL.

The cases which demand *local* excitation are familiar even to unprofessional people. Take, for example, those where stiffness and immobility of joints and articulations are the most prominent features. Here, of course, the discrimination of the medical man is required to decide between such conditions and those of actual anchylosis. In the latter case no human power can avail; but on the other hand, I may state emphatically there never was and never will

be, a "stiff joint," or accessible portion of the frame, rendered immovable by interstitial depositions—the result of inaction on the patient's part—that cannot be, by patience and perseverance, entirely restored. To this end friction plays an important part, but by no means the sole part in the cure. I need not say that these, when accomplished, really are *cures—bonâ fide*, unmistakeable. The conditions, therefore, upon which the cure of stiff joints and the like depend, are three fold; viz., innervation and vascular activity resulting from friction, passive extension of the limb or tissue, and energetic attempts at motion on the part of the sufferer.

The system of friction adopted both before and since Mr. Grosvenor's time, is very simple and easily understood. The primary object being to produce *excitation* of the part, brisk rubbing, with a certain degree of inunction, both to favour the play of the hands and prevent erosion of the skin, are necessary. In thus rubbing, it is more efficacious, and less tiring to the operator, to make long and brisk strokes, —one hand ascending whilst the other descends. The inunction, as a simple protection, may consist of fine flour, vegetable or animal oils, in not too great quantity: these frictions to commence, as to time, according to the ability of the patient to bear them, and may be usefully extended from half-an-hour to three hours daily. Most of my readers may have smiled over the popular notion of the efficacy of "joint oil," where it is needless to attribute the good result to the simple process of friction. It is yet an instinctive and harmless belief of the uneducated classes. The methods for producing *motion* of the affected part will appear under that heading; I shall, therefore, call attention to the class of cases where the former is applicable.

Friction is contra-indicated in all scrofulous cases where suppuration appears to be inevitable; yet, before such symptoms exist, it may be used with equal safety and success. In all cases where inflammation is actually existing, or but slowly subsiding, except such as may be observed in what are termed inflammatory gout and rheumatism; and here it should at the same time be held as a maxim of the deepest importance, that the earlier it is resorted to on the subsidence of inflammatory action, the more speedy, certain, and lasting will be its results. In anchylosis it is barely necessary to say it can be of no service; yet there are many cases of false anchylosis, and, probably, many where that fatal natural necessity might have been obviated by timely and judicious application to one, at least of the mechanical methods,—viz., *friction*, *pressure*, or *percussion*. The instances where friction is fairly indicated, lie in all the earlier stages of *stiffening*, so to speak; for, subsequently, the only effectual means of cure is too often to be sought in *percussion*. These are comprised by local paralysis, sprains, fractures, wounds to ligaments and tendons, excessive secretions of synovial fluid, all interstitial deposition of blood or fluid, care being taken that there exist no severe inflammatory symptom. Indeed, wherever the circulation in such cases is languid, these means

must be resorted to, or the individual may in all future time be hopelessly debarred some one essential function of his framework. Every sufferer should be strenuously forewarned of this,—if the baleful effects of ignorance, obstinacy, and idleness, are to be counteracted. I repeat, *all* contractions of joints not anchylosed, can be restored, in time, perfectly and effectually. The rule of rubbing is to begin very gently at first; and in all cases where it is intended to bring parts into a state of normal activity, friction should precede motion,—or, what is more readily comprehended, the first attempts at motion. The latter, of course, will be of the passive kind: where there are adhesions, they must be broken down,—after the usual plan adopted by surgeons. It is also a most necessary method to pursue, both after orthopœdic operations and primary ruptures, or other injury to tendons; whilst without it, there is no chance of restoring the natural tone and secretion of *bursæ*,—that is, after all symptoms of inflammatory action shall have subsided within them. These latter important agents in the mobility of a muscle or limb, are too often lost sight of. Nor should the same treatment be neglected, even where painful rheumatic affections exist, or inability either to extend a limb or place it upon the ground; for both conditions will wonderfully disappear by gentle and assiduous rubbing. An excellent example of this is afforded in cases of acute *gout*, where relief is almost immediately experienced by the patient after friction, which must at first be commenced at a distance from the affected or inflamed part, gradually approaching it as the pain subsides. The result is so certain, however indisposed a person may be to permit the remotest attempt at touching the irritable member, that many a sufferer may, if the process be early commenced, look for a good instead of a bad night, and a speedier termination of the fit, as well as after-contractions,—thickening and deposition being entirely obviated. I speak of this merely as an aid to other internal medicinal measures. In this instance the friction must not be employed in the usual way, but the hand must be passed lightly upwards,—that is, *from* the seat of inflammation, gradually approaching the part inflamed, when such appears to be the effect produced upon the vessels leading from the seat of pain: even the part itself, the great toe for example, can be safely submitted to the operation. But if not performed slowly, carefully, and gently, it is an operation that may meet with rather an unfavourable response on the part of the gouty patient.

It was a remark of the celebrated Lord Bacon, that "men quarrel with the humours which are not at fault, the fault being in the very frame or mechanic of the part." He might have justly said the same of the neglect of so important an agent as friction; for it is apparent that there is a power possessed both by the nerves and arteries of a part to produce, on the application of friction, a great and instantaneous change in its circulation, independent of any impulse derived from the heart. More than this, the heart has been, as it were,

reached by these means, for a man has been recovered after hanging half an hour,—the neck of course not having been dislocated. The phenomena exhibited by frictions, especially in the relief of local pains, are very striking. It has oftentimes seemed to me as if, by exciting local nerve stimulus remote from the seat of pain, we calm, by counter-irritation probably, the existing hyperæsthesia. Dr. Struthers, of Edinburgh, observed a similar indication, for he mentions the effect of the application of a few leeches in inflammatory affections of the abdomen, when general bleeding was out of the question. The late Dr. Parry, of Bath, largely enforced these principles of exciting local action; and this is why friction to the abdomen is so useful in cases of obstinate constipation, accompanied of course by active movements to the muscles of that region.—*Medical Circular, Sept.* 30, 1857, *p.* 157.

116.—ON THE ESCHAROTIC ACTION OF SULPHATE OF ZINC.

By Dr. Eben. Watson, Surgeon to the Royal Infirmary, Glasgow.

[In those cases of old callous ulcers with elevated margins and pale unhealthy granulations, Dr. Watson has tried with success various plans of treatment, all of which accomplish the same end, though in somewhat different ways. Such are Syme's plan of applying a blister over the whole surface, and the application of solid nitrate of silver and dilute nitric acid.]

I have chosen several cases of very callous ulcers, for a trial of the sulphate of zinc as an escharotic, and shall now state the results of this trial.

Case 1.—The first case in which it was tried was that of a man who had five callous ulcers on the left leg, apparently of syphilitic origin.

On the 20th January, an ointment, consisting of anhydrous sulphate of zinc, mixed with glycerine, was spread upon bits of lint the size of the ulcers, on which they were then laid; they were retained in apposition with the sores for eleven hours, during which the man suffered very acute pain, and when the dressings were removed the parts beneath were found corroded. A poultice was applied and opiates freely administered, but the pain continued very severe for several days and nights; by the fifth day the sloughs had all separated, they were peculiarly tough and leathery in their consistence, and about $\frac{1}{8}$th of an inch thick; the surfaces thus exposed were healthy and granulating, they speedily rose to a level with the neighbouring parts, and became skinned over so as to diminish the size of the ulcers fully one-half; but owing to some cause which I cannot satisfactorily explain, and which was probably of a constitutional nature, the healing process was then arrested, and on the 3rd of March most of the ulcers remained still

uncovered, but filled up with indolent granulations, while in one case these had been partially destroyed by secondary inflammation.

Case 2.—In this case the ulcers were larger; they were situated on both legs, of fully a year's duration, and also of apparently syphilitic origin.

January 21st. Ointment of sulphate of zinc, the same as in former case, was applied on lint over the ulcers; the pain occasioned was so great that the dressings were removed in an hour and a half after their application; the ulcers were, however, already corroded; poultices were applied and opiates administered. Two days afterwards the sloughs began to separate, and the sores were then dressed with camphorated oil, over which poultices were applied. By the 25th all the sloughs had separated; they were thinner, but of the same character as those in the other case; the surfaces exposed were healthy and granular, and by February 3rd they are reported to be "nearly closed." In a few days afterwards the patient was dismissed cured.

Case 3.—The powder of the anhydrous sulphate of zinc was sprinkled over an old and callous ulcer of leg; it caused immediate and very acute pain for five hours, when a draught of morphia put the patient asleep; he awoke free from pain; the ulcers were corroded and rendered brown on the surface; beneath this crust they rapidly healed without the separation of more than a very small slough, which left a healthy granulating surface. In this state the man was dismissed at his own request.

My friend, Dr. M'Ghie, had the sulphate of zinc fused and run into moulds, and in this form it was applied to several ulcers, acting as a good but very painful escharotic. On the suggestion of the same gentleman, I gave a trial to the bisulphate of potash as an escharotic. I employed it in the form of powder, and also in that of an ointment with glycerine, but its action was found to be very feeble; it gave little pain indeed, but the sloughs were very slight and long of separating. I then used a mixture of the sulphate of zinc and bisulphate of potash; this mixture acted more powerfully than the bisulphate alone, but its action was probably due to the presence of the sulphate of zinc, the other ingredient only acting as a diluent. In one case I had the powder of sulphate of zinc mixed with gypsum, in the manner in which Dr. Ure long ago applied the chloride of zinc, and I believe this to be a useful mode of applying it; the action of the escharotic is thus rendered more gradual, and perhaps less severe than when applied in any other form.

In two cases I procured the removal of syphilitic warts, one in the neighbourhood of the anus and the other on the prepuce, both covered with skin, by the action of the sulphate of zinc; thus showing that that escharotic will destroy the skin if kept in contact with it for a sufficient length of time.

The idea of attempting to destroy by escharotics certain tumours, and even cancerous ones, of greater size than those just referred to, is

by no means a new one, and the practice has been defended on various principles. Thus Dr. Ure thought that the substance of cancer consisted chiefly of albumen, and that, as the chloride of zinc had a strong affinity for that proximate principle, it was fitted to search it out among the tissues of the affected part, in a way that no surgeon could do with his knife. But, unfortunately, other and more recent analyses of cancerous matter do not bear out the opinion of Dr. Ure; and, on the other hand, the substance of most of the tissues and organs with which cancer is usually mixed, consist normally, in great measure, of albumen; besides, we have it abundantly in the blood, circulating in the vessels of the part. On Dr. Ure's supposition, therefore, of chemical affinity, no selection could be made by the chloride of zinc between healthy and unhealthy parts. This is equally true of the sulphate as of the chloride of zinc. In whatever way it destroys the life of tissues, there is no selection made between the normal and the abnormal. There is no sparing of this part or that; but all are involved in the same destruction, until the destroying agent loses its power, or is removed.

It may be asked if, after all, the sulphate of zinc is capable of removing such a tumour, for instance, as a cancerous mamma; and my answer would be, that it is capable of such an action if the applications are very frequently repeated in immediate succession, so as to maintain the destructive action for a sufficient length of time. But the pain endured by the patient during this tedious process must be far greater than that of excision of the affected organ. In the latter case, chloroform may be used to free the patient entirely from the pain of the operation; and afterwards, in the great majority of cases, the pain of the wound and of its dressing is very little complained of; while, on the other hand, the pain of the escharotic is prolonged over far too long a time to admit of the employment of chloroform for its relief. Indeed, from what I have seen of the action of the sulphate of zinc, I am tempted to think that it is both too painful and too slow an agent to be used for the purpose above referred to, and that the chloride is more likely than the sulphate of zinc to be the chief ingredient in the empirical applications so much vaunted of late. It must be admitted, however, that the process of so-called cancer-curing, is now well known to be both slow and excruciatingly painful—a fact which rather tends against the opinion just expressed, as to the nature of the escharotic agent in the mystical paste. That opinion was founded on the comparative suitableness of the two substances named; but perhaps such an argument has not much weight in reference to an empirical nostrum invented and applied by ignorant persons.

With regard to the question of the superiority of escharotic applications over the knife of the surgeon, there is no doubt in my mind, and I believe there will ere long be no doubt in the minds even of those who are at present forsaking the consulting rooms of scientific surgeons for the abodes of charlatans and cancer-curers. No escharo-

tic can extirpate the disease more surely than the knife, in any case suitable for interference by the surgeon at all. While the disease is local, while the system is little, or not at all affected by the cancerous poison, surely the removal of the whole organ affected, when performed by a person capable of judging of the soundness of the parts in which he cuts, gives a more rational prospect of cure than leaving the extirpation to the blind operation of a tedious and indiscriminate chemical agent of destruction. Yet I do not mean to say that there are no cases of cancer in which I should use escharotics; but I would restrict their employment to cases in which no thorough extirpation of the growth was to be attempted, and in which the healing, or, at all events, the modification of some cancerous ulceration was the sole object in view. For this purpose I believe the sulphate is perhaps as suitable as the chloride of zinc; but I cannot say that I think it at all superior.—*Glasgow Med. Journal, April*, 1857, *p.* 46.

117.—ON SOME OF THE USEFUL APPLICATIONS OF THE PERMANGANATE OF POTASH.

By Dr. G. F. Girdwood.

[The permanganate of potash possesses both deodorant and escharotic properties;—its use was first suggested to the author by his son, Mr. Prout Girdwood, as very suitable in a case of cancer of the os uteri, where the offensive discharge was extremely distressing to the patient.]

At Prout's suggestion I now employed it in the double capacity of deodorant and escharotic, to destroy the fœtid odour and to check the exuberant granulations, and induce a healthy appearance of the ulcerated surface. I employed it as a lotion, twenty grains to the pint, injected frequently during the day, and was much pleased with the comfort given the patient by the efficacy of this agent.

Being so well satisfied with it in this lady's case, I was induced to employ it in the case of a naval officer of rank then under my care, afflicted with cancer of the breast, a malady to which he is unhappily hereditarily predisposed. Here also the application has been most serviceable. Its application as a powder, sprinkled on the sloughy mass, or as a lotion (ten grains to the ounce) to the surface of the wound, has not been attended with pain. From a gaping sore, in most offensive condition, it has occasioned the wound to assume, in some parts, a disposition to granulate. The odour of the apartment previous to the employment of the permanganate was so offensive as seriously to compromise the comfort of the admiral's family. This inconvenience is entirely removed.

In the case of a barrister, of great talent but irregular habits, I was consulted, in the spring, respecting a most unhealthy eroding ulcer on the thigh. It was one of those foul ulcers we meet with in constitutions broken down by syphilis or intemperance, and where the

dyscrasis is so great as to baffle the ingenuity of the profession to restore a healthy action in the system. The permanganate was here applied as a lotion, and was most efficacious in removing the slough, cleansing the sore, and inducing healthy action.

An elderly female, long afflicted with caries of the tibia, which, from the offensive odour generated by this condition of bone, prevented her performing the duties of her position in life with any comfort to those around her, has enjoyed perfect freedom from this annoyance ever since she has had recourse to the permanganate as an application to the leg.

A married young woman, of a scrofulous habit of body, applied to me with a foul sore on the shin as big as a florin. I thought it not unlikely there might be a syphilitic taint in the system, superadded to the scrofulous taint she inherited, so the general treatment was in accordance with this view of the matter. The wound was cauterized with nitrate of silver from time to time, at each application giving much pain. Recollecting that, in the second case I have narrated, the application of the permanganate as a powder gave no pain, I tried it in this case ; but the pain was as great as if I had used the lunar caustic. The difference was no doubt referable to this fact, that in the former case the cancerous mass was a mass with diminished sensibility, whilst in the latter case the prurient granulations had increased the sensibility.

A gentleman, aged forty-five, full six feet high and large in proportion, and of a most placid temper, holding a judicial appointment in India, returned home early this year to attempt to recruit his broken-down constitution. His sedentary duties had been too much for him. He had been seized, whilst on the bench, with symptoms of low congestive fever, accompanied by dyspnœa and general œdema. These symptoms had been followed, in four and twenty hours, by a blackened state of the calf of the leg, which rapidly became gangrenous ; and an extensive ulceration, involving the middle of the leg round and round, and removing much of the muscular as well as all the cuticular structure, was the result.

This extensive injury had, by the time of his arrival in this country, become somewhat less extensive by the process of cicatrization ; but as he was obliged to be on his legs on his arrival more than was beneficial, he found himself obliged to lay up ; and when I saw him, I feared a relapse into a state as serious as that he originally had, and of which he produced a very interesting and detailed medical report from his attendant in India. The odour from the leg was most offensive. The surface of the wound presented a most unhealthy appearance, whilst the blackened condition of those parts where cicatrization had taken place made me anxious as speedily as possible to remove this condition of congestion.

Rest and position were of course, under these circumstances, the elementary principles of relief ; but, in addition, the lotion was again

here applied, of the strength of four grains to the ounce, and I cannot sufficiently express the benefit I witnessed—the prurient granulations were kept down, the offensive odour removed, and cicatrization went rapidly on.

The foregoing statement indicates the variety of cases in which the permanganate of potash may be applied. It may be remarked, that I have used the remedy generally as a lotion, but although I have not found it necessary, for the purposes I have generally required, to use the remedy in a stronger form, I would recommend when it is wished to destroy masses of cancerous growth, its use in the solid form, either as a powder, as I have done, or in a mass, as the sulphate of copper or other caustics. The lotion supersedes all the charcoal, yeast, and carrot poultices. Let this simple solution—make it as weak as may be thought requisite to effect the object—two to twenty grains, or more, if liked—be used on a piece of lint, instead of any of these applications.

The permanganate of potash is more useful than any of the other compounds of manganese and potash as a caustic or deodorant. The permanganic acid contains more oxygen than the manganic. The permanganic acid has the composition $M\ N_2\ O_7$, whilst the manganic acid has a composition $M\ N\ O_3$.

As the escharotic action of these bodies, as well as their deodorant quality (a quality which has been long known to chemists), depends on the ease with which they part with the oxygen with which they abound, clearly that preparation which yields the larger quantity of oxygen must be preferable: this is the permanganic acid as permanganate of potash.

As a deodorant, as an escharotic, as a stimulant, it is a most useful application, combining as it does all these three qualities. But as a quality still to be claimed in its favour is the ease of its exhibition as a lotion applied to, or in powder sprinkled on, the sore, or as an injection. To conclude, I may say that whilst from the foregoing relation its advantages have been attempted to be illustrated, its use is also suggested in every sort of case where it is desirable to combine all the qualities this agent so beneficially possesses. In such cases, for instance, as old chronic ulcers, warty growths, syphilitic sores as a caustic in the primary stage, or in gonorrhœa as a stimulant injection.

I have mentioned that Mr. Blyth originally brought the substance under my notice as a deodorant. I have used it in the manner he advised me, and have found it most admirably adapted for the office. A teaspoonful of the substance powdered, added to a tablespoonful or two of water, just enough to moisten it well, and sufficient to cover the surface of a flat dish,—a dinner-plate, for example, being used for the purpose,—giving a broad surface for absorption, and this plate placed under the bed or anywhere most convenient in the sick chamber, all odour disappears. Let it be borne in mind in favour of this substance, as an advantage above those in general use in the sick

chamber, that it has no odour of its own. Vinegar and chlorine and nitrous acid gas are often of themselves a nuisance ; whilst destroying one odour they create another ; but the permanganic acid has none. It only destroys ; it does not create. I have employed it in my stable and in other places engendering odours. All these odours are destroyed by the dish containing the solution. This solution does not require frequent change. Has it lost its original beautiful purple colour ? Has it become black and slimy ? If so, renew it, but not till then.

The permanganate of potash was introduced some time ago as a remedy in diabetes, so that it is well known to chemists. Mr. Blyth informs me it may be purchased (wholesale and cheap) at the Battersea Chemical Works ; but for professional purposes, as an escharotic in strong solution or in the solid form, it may be obtained from most of the respectable chemists.—*Lancet, Sept.* 12, 1857, *p.* 269.

118.—*On Phosphorus as a Poison.* By Dr. C. W. Bingley, Lecturer on Chemistry to the Sheffield School of Medicine.—[The following observations are founded on experiments made by the author some months since, in concert with Dr. Harley, of University College, London.]

From the results of these experiments, I conclude that phosphorus may act, in the first instance, as an irritant poison in exciting inflammation of the mucous membrane of the stomach, not being so active an irritant, however, as either arsenic or corrosive sublimate ; but from the symptoms immediately preceding death, I incline to the opinion that this poison bears considerable analogy to strychnine in the manner in which it acts upon the animal frame—not by a direct action upon the nervous system, as was formerly supposed, but by preventing the assimilation of oxygen by the constituents of the blood. From the analyses of the blood, flesh, brain, heart, liver, and lungs of the animals poisoned by phosphorus, we saw that phosphoric acid was present in abnormal quantity. It therefore appears that the phosphorus enters into combination with oxygen in the stomach, to form phosphoric acid, and it is doubtless as such absorbed into the blood. The inflammatory action in the mucous membrane of the stomach would most probably take place during the slow transformation of the phosphorus into phosphoric acid in that organ. Dr. Harley has shown, by direct experiment, that strychnine and some other poisons possess the property of so modifying the organic constituents of the blood as to render them incapable of absorbing oxygen, and exhaling carbonic acid, and thus becoming fitted for the purpose of nutrition ; and pointed out how they may in this manner produce convulsions, and ultimately destroy life. I imagine that phosphorus, like many other poisons, acts upon the blood in the manner ascribed by Dr. Harley to strychnine, and thus in a similar way destroys the life of the animal.—*Lancet, June* 13, 1857, *p.* 601.

119.—ON THE ADULTERATION OF BREAD AS A CAUSE OF RICKETS.

By Dr. John Snow.

[Rickets is a disease very prevalent indeed in the metropolis, generally shown by curvature of the bones of the leg. The author some years back noticed that the complaint was by no means confined to the poor, but affected the middle classes to a considerable extent; nor to the most sickly and scrofulous children, for healthy well-nourished children often suffered most. Another remarkable fact, showing that want of exercise, of good food, and a scrofulous taint are not the most powerful operating causes, was that in the northern towns of England this disease was far less common than in the metropolis, although the same apparent causes were in operation.]

The bones owe their hardness to phosphate of lime, which exists ready formed in many articles of food, and only requires to be assimilated, while in rickets the phosphate of lime in the bones is known to be deficient; and therefore it seemed extremely probable that the want of this earthy salt in the food of the infants of this metropolis was the chief cause of the soft state of the bones. My attention was naturally directed to milk, which contains one chief supply of phosphate of lime, and which is somewhat scarce and dear, and not of the best quality in London; but I immediately recollected that in some of the mining and manufacturing districts in the northern counties of England milk was scarcely used at all in the families of the operatives, and yet I had hardly seen a case of curvature of the legs from rickets. On reflecting on the subject of bread, however, there seemed to be something which might explain the prevalence of this complaint in London. In the northern counties, where coals are cheap, it was the universal custom for every family to bake their own bread, and I believe still remains so; whilst in the south of England it is as much the custom to buy bread from the baker. Now, the bakers, so far as I have examined, all put alum in their bread, whilst this is never done in domestic practice, and the flour dealers rarely adulterate the flour with this substance. They are liable to a heavy penalty for adulterating flour, but the law is never enforced against the bakers. I have never examined a specimen of flour which contained alum, or a specimen of baker's bread which did not contain it.

When my attention was first turned to the subject of rickets, I thought it likely that the sulphuric acid of the alum would decompose the phosphate of lime of the wheat, and form sulphate of lime, which would not be available as nourishment for the bones; and I formed an intention to investigate the question both chemically and statistically; but this intention was long postponed, on account of other engagements and inquiries. In the meantime, and without any regard to the question of rickets, Liebig has inquired into the action of alum in bread, and his investigation will justly have more weight with the

reader than any inquiry of mine. He says, "Since phosphoric acid forms with alumina a compound hardly decomposable by alkalies or acids, this may perhaps explain the indigestibility of the London bakers' bread, which strikes all foreigners."

It is evident from the above passage that Liebig has ascertained that alum decomposes the phosphate of lime of wheat, and it is not likely that the bones would be able to nourish themselves with this salt out of phosphate of alumina and sulphate of lime; and where bakers' bread forms the chief and almost the only article of food, as it does amongst the children of the working classes in London and many other towns, one might expect the bones to be ill-nourished, as regards their earthy and hardening material. This appears to be the actual fact, as far as I have been able to extend my inquiries. The subject is capable of being decided by an exact numerical investigation, but I have thought it better to publish my inquiry in its present imperfect state, than to wait till I should be able to make such a complete research as I could wish, more especially as, by directing the attention of the profession to the question, it may be earlier decided. I expected to be able to contrast some of the large institutions containing young children in this metropolis with each other; but, so far as I have inquired, they are all supplied alike with bakers' bread containing alum. So far as I have been able to learn, rickets are not common at present in the towns in the north and west, where home-made bread is chiefly used; and I was lately told, that in one town in Cornwall, where the people make their own bread, this complaint is almost absent; whilst in a town a few miles off, where bakers' bread is consumed, the complaint is extremely common; but as my inquiries have been only of a colloquial nature, I hesitate to mention places and persons. If it could be obtained, perhaps a return of the number of cases of rickets in the children under four years, as compared with the whole number, which are brought to the dispensaries, in towns where respectively the people buy chiefly flour or ready-made bread, would best help to decide the question.

It does not follow, if my conclusions are correct, that every child eating bread adulterated with alum ought to have rickets, or that every child fed with good bread ought to be free from the complaint; for, on the one hand, the other articles of food may often supply sufficient phosphate of lime without that of the bread, and, on the other hand, derangement of the digestive and urinary functions may prevent the phosphate of lime being assimilated when present. What we might expect, however, would be precisely what we observe—that rickets would be much more common in the children of the working classes fed almost entirely on bread than in those who have a greater variety of food. It can also be explained how the bones ultimately become hard from the gradual accumulation of the scanty supply of phosphate of lime derived from milk, potatoes, and other articles of food, whilst that which ought to be supplied in the bread is still withheld.

If the deformity in the bones of the legs does not proceed too far, it has a great tendency to diminish, and even disappear, as the children grow up; and the artificial support which is afforded by iron instruments and splints, both in the various hospitals for deformities, and under the advice of private medical men in London, diminishes very much the amount of permanent deformity which would otherwise be met with.

In my examinations of bakers' bread I have been much struck with the apparent universality of the practice of using alum, and with the large quantity employed—a quantity between twenty and thirty times as great as that usually stated by authors. I have met with alum, not only in the ordinary bread sold by bakers, but also in captains' biscuits, and in the so-called farm-house bread: and I was somewhat surprised to find that the high-priced bread, sold in the fashionable neighbourhood to the west of Regent-street contained more alum than the cheap bread sold in many of the poorer districts. I found that the bread supplied to me last autumn contained 10·13 grains of alum in 500 grains—i. e., 561 grains, or more than an ounce and a quarter in the 4lb. loaf; whilst some bread obtained from a very noted baker contained 11·37 grains in the 500 grains, or nearly an ounce and a half in the 4lb. loaf. The following is a brief account of the analysis of the latter bread:—500 grains being carefully dried at the temperature of 100 Fahr., lost 128 grains of water, or more than one-fourth. Being carefully incinerated in a crucible, the ashes weighed 5·85 grains. The ashes yielded alumina, which, being washed, dried, and ignited, weighed 1·2 grain, representing 11·37 grains of crystallized alum; with chloride of barium, they yielded 1·4 grain of sulphate of baryta, and with the nitrate of silver, 6·7 grains of chloride of that metal, representing 2·8 grains of common salt.

Dr. Hassall and some other authors have very properly pointed out that the only safe way to seek for alum is to incinerate the bread, and examine the ashes; but many writers go on repeating the statement that alum may be found by digesting the bread in distilled water, filtering, and applying tests to the water. In this way seldom more than a trace of alumina can be detected, even when the bread contains a large quantity; but it is probable that many persons take this short and easy method of examining it, and it is probably in a great measure owing to this circumstance that the bakers continue to use alum with so much impunity. An instance came under my notice not many months ago where a baker expected, with the utmost confidence, to have a satisfactory certificate to lay before the committee of a club-house respecting his bread, although it contained a great quantity of alum.

A probable way to break through what seems the universal practice of bakers to adulterate bread, would be for the committees of the public hospitals and the guardians of the poor to oblige the bakers who contract to supply their respective institutions to furnish an un-

adulterated article. No one pretends that alum is either nutritious or wholesome; and if the loaves without alum should cost a little more, owing to their carrying less water, no one can doubt that as much nutriment would be obtained for a given sum as under the present system.—*Lancet, July* 4, 1857, *p.* 4.

120.—A CASE OF ARSENICAL POISONING BY A DECORATIVE WALL-PAPER.

By Dr. W. Hinds, Birmingham.

[The following particulars were communicated to the author in a personal interview with the gentleman who is the subject of them.]

In the early part of last year (1856) a gentleman in business in one of the central parts of Birmingham, and being in perfect health, as were also those about him, had two parlours newly papered with a bright green paper. In less than a week afterwards he became ill, but knew no cause for his illness. Both himself and his wife sat in one of the rooms regularly, burning a gaslight, the days being not long. At the same time also as his own illness came on, his wife became ill in a similar manner, and was occasionally confined to her bed. The symptoms complained of were severe prostration of strength, headache, and a low febrile state of system, together with an inflammatory state of the conjunctiva, thirst, loss of appetite, and heat and dryness of throat, with tightness across the forehead. The great inaptitude for exertion, and general prostration of strength, appeared prominent.

Not only were these two persons thus indisposed. A parrot hung up in the same room also became ill. It manifested thirst, and languor, refused its food, and seemed constantly drooping. A while after these unaccountable symptoms made their appearance, or about the time, a friend, who happened to have some knowledge of my own case previously, was solicited, quite accidentally, to admire the paper with which the rooms were just before decorated, and he at once pronounced the paper to be an injurious one. The owner, however, could not believe that there was or could be anything pernicious in the wall-paper, and after enduring the illness for two or three weeks, resolved to leave home for the benefit of his health. He went off to Ramsgate for a change, where he stayed a week, and returned home in perfect health. His wife remained at home, and got no better.

It is remarkable that in two days, as I am assured by the gentleman himself, he became as ill as ever, and then first began to dawn the conviction that the observation about the wall-paper was founded in fact. This conviction soon gained ground by the very force of circumstances. It was indeed a conviction truly forced upon him directly against his will, and became seriously earnest, as he had by this time got really alarmed for his own and his wife's welfare. Having borne these distressing symptoms for several weeks, they at last determined to have

the whole of this new paper removed from both their rooms, and I am assured that they recovered their health in less than a week afterwards.

While it appears so difficult to convince many persons speculatively of the fact of the pernicious agencies of this arsenical wall-paper, it is very remarkable that in the case of this gentleman, who was so disinclined to believe, the conviction which he has derived practically is deeply rooted, and seems to have been ratified by the very force of his suffering.

While, probably, very few persons would predicate such effects as have been detailed, from the papers decorating their rooms, I have reason to believe that a vast deal of slow poisoning is going on in Great Britain from this cause, these injurious results being never traced to their true source.

It remains to say a few words on the *modus operandi* of the diffusion of the poisonous agent. Writing exclusively to communicate the facts to the profession, I did not on the former occasion think it necessary to give any detailed explanation, inasmuch as the scientific members of the profession were as well able as myself, if not indeed more so, to fill in these minor particulars for themselves. There can be no doubt that arsenical vapours, whether pure or in certain combinations, inhaled in respiration, get readily into the blood, and are capable of producing all the constitutional effects which are the result of absorption of arsenic from the alimentary canal. Diarrhœa is not so usually a symptom in these cases, it at present appears, as when arsenic has been taken into the stomach; and that is just what we might presume would be the case as to the early periods at least, or in cases of slow poisoning through the medium of respiration, inasmuch as the irritant is not primarily in contact with the alimentary canal. On the other hand, we have the well-marked signs of a severe local irritant in other parts, just such as the arsenical dust would be expected to produce, namely, irritation of the air passages, the nasal passages, the conjunctivæ, the mucous membrane of the throat, and of the frontal sinuses, yielding the severe frontal pain and tightness, the hot and dry state of the posterior nares and throat, and the epiphora.

That the water-colour pigment forming the patterns upon a wall-paper is constantly yielding dust to the atmosphere of a room can admit no question. A puff of wind or an ordinary current of air floats off myriads of particles, especially during the process of drying, either when the paper is new, or whenever dampness from the weather may have subsequently affected the paper and its colour. In some papers which I have examined there seems an almost entire absence of tenacity, as if the pigment were stuck on with water merely. A dry napkin just rubbed lightly over the green patterns will exhibit abundance of the colour-dust, and even where the gummy or glutinous constituent of the colouring agent be in sufficient quantity, there is no doubt that the patterns still lose gradually their tenacity to some considera-

ble extent, and especially by alterations in the hygrometric state of the atmosphere.

It may have been known, possibly, to others in this country; but until after my attention was directed to this subject in my own case, I was not aware that this very matter is taken cognizance of by the Prussian sanitary police. In an instructive periodical work, I have lately met with some observations on this subject by Dr. Scoffern, and I give the following very interesting passage:—

Dr. Scoffern observes, "As you intend to reside some considerable time in the Prussian dominions, you will, perhaps, set about papering your rooms. Take care in doing this you do not give the police cause to pounce down upon you. What evil can there be, you will, perhaps, say, in the papering of a room? Learn, then, for your instruction, that the Prussian police are, amongst other things, sanitary officers. Each nest or squad of them,—excuse the German names,—has its own Polizei Physicus, or Police Sanitary Physician, whose duty it is to see that nothing be done to the prejudice of the laws of public health. An Englishman whom I knew took it into his head to hang his sitting-room with paper of a certain green tint. To be in a chamber whilst the paper-hanging operation is going on, is not agreeable. The Englishman absented himself, until the time when he thought the hanging would be complete. He then came back, and was surprised to find the chamber, not merely hung, but unhung. The police had sent people there to strip the paper off. The green pigment, which the Englishman had so much admired, was a preparation of arsenic, Scheele's green; and for this reason it was considered to imperil the public health. A rather far-fetched notion was this; but I know the event to be true."

In a note to the above, the writer remarks, "Whilst the above was still in type, uncorrected, a fact has transpired proving that the Prussian sanitary officers were right, and that my surmise of the idea being far-fetched, was wrong. A medical gentleman of Birmingham writes to the editor of a journal to state that he had suffered from sitting in a room papered with arsenical green hangings. The heat of a gas-flame evaporated the pigment, and filled the room with deleterious fumes."

In a former paper I alluded to two characters by which the arsenical green paper could be recognised—at least, by a practised eye:—namely, the elegant brightness of the pigment, and the imperfect way in which it usually adheres to the paper when closely examined, showing a little "running," as if put on a somewhat greasy surface. It is proper, however, to mention, that in many of these arsenical papers which have come under my observation neither of these characters is very evident, the two characteristics relating to the colour only in its purity. I often see these papers, with the natural tint of Scheele's green made lighter by means of mixing a little whiting or some such substance, in order to contrast with a very dark green flock, which

forms portions of the pattern or ground, and this modification of the colour appears to make the arsenical green "take" more kindly to the surface of the paper.—*Medical Times and Gazette, May* 23, 1857, *p.* 521.

121.—ON TESTING FOR ANTIMONY AND ARSENIC.

By Henry Hough Watson, Esq., Corresponding Member of the Literary and Philosophical Society, of Manchester.

Owing to the extreme facility there is in applying Reinsch's process, and the great delicacy of it in separating arsenic and antimony from organic matter containing them, it has, of late years, generally been resorted to by chemists and toxicologists, almost entirely to the neglect of Marsh's process, in investigating the numerous cases of poisoning by arsenic which have occurred; and there has been no difficulty in proving the metal deposited upon the copper to be arsenic, when the coated copper was heated in a subliming tube (the arsenic being thereby oxidised and converted into arsenious acid), and when, afterwards, the ammoniacal nitrate of silver, the ammoniacal sulphate of copper, and the sulphuretted hydrogen tests were applied; but, as till within the last year, attention had not been directed to cases of criminal poisoning by antimony, equally easy and direct means were not known of proving, by indubitable results, that a coating or deposit obtained on copper was antimony. Dr. Odling has, however, in the last volume of 'Guy's Hospital Reports' (vol. ii., Third Series), described a method, discovered by him, of oxidising and bringing into solution a deposit of antimony, in such manner that all the striking and decided characteristics of this metal can be readily and satisfactorily elicited; and perhaps every chemist, whose attention has been drawn to Mr. Odling's paper, will admire and highly appreciate his process; but, it may be questionable whether any can so completely prize it as those who have had cases of poisoning by antimony to investigate both before and since its publication. I am one of the few who have had to detect and prove the presence of absorbed antimony in the tissues in case of poisoning before and since the publication of the paper; and I feel that I cannot too freely acknowledge the superior value of the aid rendered by the process over the other more complex means I had to adopt previously. Yet, though beautifully simple and eligible, as Dr. Odling's process is, consideration of the principle on which it is founded has led me to the discovery of another method, at least equally simple, and, I think, generally, even more eligible, except, perhaps, when the deposit is so thick as to crack off the copper. But, before explaining, it may be well to contrast the position we were in up to the time when the last volume of 'Guy's Hospital Reports' appeared, with the altered one since.

It seems that the Palmer trial was the first criminal case in which Reinsch's process had been used for separating antimony from the tis-

sues; and in that instance Dr. Taylor heated the copper, on which he had got the antimony deposited, with nitrate of soda in a platinum crucible, thereby converting the antimony into antimoniate of soda, which he dissolved or diffused in water, acidulated with hydrochloric acid; and he then precipitated by sulphuretted hydrogen; but, instead of obtaining a precipitate of a decided orange-red colour, which is desirable, as characteristic of the pure sulphuret of antimony, he obtained one of a reddish brown colour, undoubtedly the sulphuret of antimony mixed with some sulphuret of copper; and, therefore, not so satisfactory as an orange precipitate would have been in confirmation of the results of the other tests which he applied. Aware of this, I was induced to pursue another course in testing the antimonial deposit I obtained on copper in a case tried at the Liverpool Assizes in August lost (Regina v. McMullen). And, as my proceedings in that inquiry have not been published, a somewhat detailed account of a few of the experiments may here be acceptable, more particularly as application has been made to me by several scientific inquirers for information as to the method I pursued on the occasion.

In one experiment I dissolved 7555 grains of the liver, by boiling it in diluted pure hydrochloric acid; and in the hot solution I immersed bright sheet copper, the surface of which was about twenty-two square inches. The copper was kept in the hot solution for four hours, when it was found to have acquired a comparatively thick coating of a violet lead-coloured metal. It was then washed and dried; and, on bending it, some of the coating cracked and fell off it. The quantity which thus fell off weighed a quarter of a grain. I dissolved this quarter of a grain in nitro-hydrochloric acid, and evaporated the solution to dryness; I dissolved the dry residue, by the addition of hydrochloric acid, and to this hydrochloric solution water was added, which caused a bulky white precipitate—the sub-chloride of antimony; but the liquor contained some copper, which was evident from the colour of it; and, therefore, I separated the white precipitate from the liquor, and washed it well, to free it as perfectly as practicable from the liquor. I then dissolved the white precipitate by the addition of solution of tartaric acid, and passed sulphuretted hydrogen gas through the solution, whereby a precipitate of sulphuret of antimony, of a tolerably pure orange-red colour, was obtained. These several results gave full, satisfactory proof that the coating which cracked off from the copper contained antimony. I also passed sulphuretted hydrogen gas through the solution, or liquor separated from the white precipitate, and a nearly black precipitate of sulphuret of copper was obtained. This sulphuret of copper appeared to be nearly as much as the orange sulphuret of antimony; from which I concluded that only about one-half of the quarter of a grain of the coating might be antimony; but the quarter of a grain was only about one-half of the coating on the whole of the twenty-two inches of copper.

After the twenty-two inches of copper had been removed from the so-

lution of the 7555 grains of liver, I immersed three other pieces of copper in the same hot solution, consecutively, for four hours. In each instance I got a coating upon the copper, strong upon the first of the three pieces, and weak upon the last. From their appearance, I concluded that there could not be less than another quarter of a grain of antimony deposited on them; and I believed that from the whole of the 7555 grains of liver I had separated half a grain of antimony, making the total in the whole liver (which weighed four pounds) about 1·85 grains, equal to rather more than 4·9 grains—say to 5 grains—of tartar emetic.

The orange sulphuret of antimony, obtained as mentioned, was dried, and then dissolved by heating it in strong hydrochloric acid. I introduced the solution, along with diluted sulphuric acid and zinc, into Marsh's apparatus; and the flame of the gas produced gave deposits of metallic antimony upon a Wedgewood's ware pestle applied to it; which deposits did not dissolve with strong solution of chloride of lime.

In another experiment, in a solution of about one-eighth of the whole liver in diluted hydrochloric acid, I immersed a piece of pure zinc (after having further diluted the solution with water so much as to make it act but feebly on the zinc), and kept it in the solution for four days, at the expiration of which time it had acquired a dark-coloured or soot-like coating of or containing antimony; for, when the zinc so coated was put into Marsh's apparatus with pure diluted sulphuric acid, the gas produced gave deposits of metallic antimony, not soluble by the application of chloride of lime. The result of this experiment was a valuable corroboration of the results indicative of antimony from the other experiments.

Dr. Odling's process, published since the trial of M'Mullen, consists in first boiling the coated copper in solution of permanganate of potash with a little excess of potash for a few minutes, by which the antimony becomes oxidised, and the oxide is dissolved by the excess of alkali; then filtering the solution, slightly acidulating it, and passing sulphuretted hydrogen gas through it; the truly characteristic orange red precipitate being thereby produced, which may be collected and further tested in the usual manner. It will be perceived how much more directly the orange precipitate is obtained by this process than by that I had to adopt in M'Mullen's case. As Dr. Odling remarks, one ebullition, one filtration, and one reaction, are all that are required for the complete identification of the antimonial deposit; that is, so far as it can be identified merely by the orange-red precipitate. But, as it is, of course, requisite to test the purity of the potash and of the permanganate of potash used, so as to see that they do not contain antimony, it occurred to me that an advantage would be gained if one of these ingredients could be dispensed with, if the antimony could be oxidised, and the oxide dissolved in solution of potash, without the aid of permanganate of potash or any other salt. Accordingly, I introduced

some copper, having antimony deposited upon it into a subliming or reduction tube, and then heated to redness that part of the tube where the copper was; the usual white amorphous oxide was formed and deposited in the tube. I then took the copper out of the tube, and poured in a very dilute solution of caustic potash. On boiling this solution of potash, the oxide soon became dissolved. I then filtered the solution, acidulated it with pure hydrochloric acid, and passed sulphuretted hydrogen gas, obtaining the true orange red precipitate of sulphuret of antimony. I have repeated the experiment many times with the same success; and I have further found that when copper, having a mixture of antimony and arsenic deposited upon it, is similarly heated in the subliming tube, it is easy to prove the presence of both metals in the sublimate formed; for instance, distilled water boiled in the tube, repeatedly, dissolves the arsenious acid from the oxide of antimony, arsenious acid being discoverable in the solution by the ammoniacal nitrate of silver, the ammoniacal sulphate of copper, and sulphuretted hydrogen; and then dilute solution of potash boiled in the tube dissolves the remaining oxide of antimony, the presence of it in the potash solution being discoverable by the orange red precipitate again resulting after filtering, acidulating, and passing sulphuretted hydrogen.

Thus far my object was attained, to the extent of being able to abandon the use of the permanganate, without substituting any other oxidising salt; but it will be observed that I had to make two heating operations—one, the heating of the dry coated copper, and the other, the boiling to dissolve the oxide in the alkaline solution. Though two heating operations are not particularly objectionable, yet I felt desirous of obviating the necessity of more than one; and a few trials showed that the object may be practicably and conveniently effected. Thus, copper coated with antimony is put into a tube, and a very dilute solution of caustic potash is added. The solution is boiled with the copper in it; and then the tube is so inclined that the copper slips out of the solution (or it may be drawn out by a copper wire) into the part of the tube where the solution is not, and allowed to remain there for a few seconds or a minute or two; after which it is returned into the solution (kept boiling hot) for a minute or two, when it is again caused to be out of the solution and in the air in the tube for a short time. This alternate immersion of the copper in the boiling liquid and the exposure of it to the air, is frequently repeated till the colour and altered appearance of the copper inform us that the antimony has been oxidised and dissolved off it. The solution is then filtered, acidulated with pure hydrochloric acid, and subjected to the action of sulphuretted hydrogen gas, when the true orange red sulphuret of antimony precipitates, as in the other instances. By the exposure of the coated copper alternately to the hot solution and (while itself warm) to the air, the oxidation and solution of the antimony go on rather quickly; so much so, indeed, that only from a few minutes to about half an hour

is required for the solution of the whole of the antimony; the length of time, between these limits, varying according to the density and quantity of antimony upon the copper.

By the exposure of copper (coated with antimony) made wet with cold solution of potash, and exposed to cold atmospheric air, a similar effect is produced; but the time required for the complete change is too long for the operation in the cold to be made available in preference to that in which heat is applied. In an experiment made in the cold, not more than half of the antimony was dissolved in thirty hours.

My attention was next turned to experimenting upon copper coated with arsenic. I exposed some alternately to the action of boiling dilute solution of potash and to air in a tube; and, as might be expected, the arsenic became oxidised, and dissolved in the solution. It, however, was not converted merely into arsenious acid, but into arsenic acid; for, after filtering the alkaline liquor, I slightly acidulated a portion of it with diluted nitric acid, and then added caustic ammonia till rather in excess; after which I evaporated to dryness, dissolved the dry residue in a few drops of water and tested with nitrate of silver which gave the brick red precipitate, indicative of arsenic acid. I acidulated the other portion of the alkaline liquor with hydrochloric acid, and then passed sulphuretted hydrogen gas, which did not immediately cause any yellow precipitate, but in a few hours I observed that a light yellow precipitate was slowly forming, and in twenty-four hours a considerable quantity of a bright lemon-yellow precipitate had fallen and covered the bottom of a half-ounce phial, in which I had corked the liquor up to keep in the sulphuretted hydrogen and exclude atmospheric air. The slow formation of the yellow precipitate confirmed the nitrate of silver test in showing the metal to have been converted into arsenic acid.

This fact, of the conversion into arsenic acid, can be taken advantage of in separating antimony from arsenic when both have been deposited on copper by Reinsch's process. What is required is to oxidize and dissolve the mixed deposit by the alternate action of boiling dilute solution of potash and exposure to the air in the tube, then to filter the solution, acidulate it, and pass sulphuretted hydrogen gas through it; and as soon as the orange precipitate of antimony has begun to collect itself together and settle, to take out this antimonial precipitate by filtering, setting aside the clear filtered liquor in a cork phial, whereby, in some hours, the bright yellow sulphuret of arsenic falls.

When the deposit of antimony or arsenic is so thick as to readily crack off and not adhere to the copper, I think it is preferable to pursue the method in which the two heating operations are required; or else to adopt Dr. Odling's permanganate process; for if the deposit falls off the copper in scales or films when in the alkaline liquor, I do not find it practicable to pass the scales or films alternately out of and into the liquor as required. It however, generally happens that in those instances when the greater part of the deposit does fall off, still a suffi-

cient quantity adheres to the copper to allow some of it to be dissolved, and its character proved.

In a case of poisoning which I have had to attend to since the commencement of this year, I have submitted copper coated by Reinsch's process (in the examination of various portions of viscera), to the action of permanganate of potash, &c., as directed by Dr. Odling's discovery; and I have also submitted other portions of copper, coated at the same time from the same viscera, to the several other methods of oxidising and dissolving the coating in potash solution herein described; and in each instance obtained the true orange red precipitate, proved to be the sulphuret of antimony by dissolving it in strong hydrochloric acid, and thereby producing a solution, one part of which when diluted with water gave a white precipitate soluble in solution of tartaric acid; and the other part of which when introduced into Marsh's apparatus, along with zinc and diluted acid, yielded deposits of metallic antimony, on porcelain and glass, not soluble by the addition of chloride of lime or of a mixture of chloride of lime and acetic acid.

I feel that I ought not to conclude this paper without expressing thanks to my friend Dr. Taylor, of Guy's Hospital, for the kind intimation he has made to me that, when only a small quantity of arsenic is obtained along with a relatively large quantity of antimony from viscera into which these metals have entered by absorption, a serious question arises as to whether the small quantity of arsenic may not have been accidentally introduced as an impurity in tartar emetic; saying that, within the last few years, he has met with this in so many instances that the fact is calculated to create alarm; and that a maker has informed him that arsenical sulphuric acid (the acid made from pyrites), is sometimes used in forming the sulphate employed in the manufacture of tartar emetic. This being so, there are two possible sources whence arsenic in tartar emetic may be derived,—one from the antimonial ore used, and another from the sulphuric acid. It is quite time that such general use of the impure sulphuric acid for pharmaceutical purposes should be prohibited; and I cannot but direct attention to the facts mentioned in a paper of mine, "On detecting the presence of arsenic," published fifteen years ago, in the sixth volume, new series, of the memoirs of the Manchester Philosophical Society, and copied into the 'Medical Gazette' of June, 1842. I therein stated, that I had detected arsenic in sulphate of potash and also in alum, made, by the aid of pyrites, sulphuric acid; and I suggested the probability that food might, consequently, in some instances, be contaminated with arsenic, as alum is often used by bakers in the making of bread; remarking, also, that vinegar is often adulterated with sulphuric acid.—*Med. Times and Gazette, June* 20, 1857, *p.* 613.

122.—ON A PHYSIOLOGICAL ACTION OF QUININE.

By Dr. Ranke.

[Dr. Ranke, during the course of some observations on uric acid, has made the following curious and important observations on the effect of quinine on the amount of that urinary salt excreted.]

Being engaged in a series of observations on the excretion of uric acid in health and disease, and under the influence of different drugs, I have observed an action of the disulphate of quina upon the healthy organism, which seems to me worth being recorded even before I shall be able to give the results of my other observations and experiments.

I found, as the uniform result of five experiments which I have made on three healthy individuals, that the disulphate of quina diminishes the quantity of uric acid in the urine.

The importance of this action of the drug, if it prove to be constant, is obvious. Hitherto our notions on the physiological action of quina have been exceedingly deficient, and so is our knowledge of the real nature of ague, for which quina is such an admirable remedy. Now in ague there is, according to all observers, a considerable increase of uric acid in the urine, and moreover the spleen, the organ principally affected in ague, contains, according to Scherer, normally, some uric acid. Is it not possible that, by the study of the physiological action of quina, we may in time be able to throw some light even upon the nature of ague and the process of its cure?

The usual method was employed for the determination of the uric acid; that is to say, 100 cubic centimeters of the urine were mixed in a test-glass with 6 cubic centimeters of concentrated hydrochloric acid, and left to stand the forty-eight hours. Then the uric acid, which had been precipitated, was carefully collected upon a filter. The weight of the filter in a perfectly dry state had been determined in the watch-glass apparatus. The uric acid was washed until the water that ran off the filter had ceased to have an acid reaction. The filter was then again dried in the air bath and weighed, and the difference between the first and second weighing was calculated as uric acid.

The following are the numbers I thus obtained, and from these the reader may draw his own conclusions. I excrete, on an average, when in a healthy state, and living on a mixed diet, 0·629 grammes of uric acid during twenty-four hours. This average is taken from twenty observations. Maximum, 0·832; minimum, 0·455; and the figures of this series are distributed thus: 0·8 and 0·7 occur twice each; 0.6 eight times; 0·5 seven times; and 0·4 once.

Now, in the first experiment I took 20 grains of disulphate of quina in the course of the day; and during the next forty-eight hours the excretion of uric acid amounted in all to 0·542 grammes, which gives

for twenty-four hours 0·271 grammes, or less than half my normal quantity.

The second experiment gave a similar result, the quantity of uric acid excreted during forty-eight hours, after 15 grains of quina had been taken being equal to 0·790 or 0·395 for twenty-four hours. On the third day, after quina had been taken, I excreted again about my normal average, namely, 0·621 grammes, and on the two following days 0·543 and 0·656 grammes respectively. I now took quina for a third time, and the quantity of uric acid again fell to 0·438 grammes on the first, and to 0·192 grammes on the second day.

The fourth and the fifth experiments were made on two of my medical friends who kindly volunteered to take quina. Here are the results.

Dr. S. excreted during the two days previously to his taking quina 0·544 and 0·543 grammes of uric acid. On the third day he took 20 grains of disulphate of quina, in two 10 grain doses, and on that day he excreted 0·376 grammes of uric acid. The next morning he again took 5 grains of quina, and the quantity of uric acid subsequently fell to 0·317 grammes. During the three following days he excreted 0·483, 0·450 and 0·654 grammes respectively.

Dr. M. excreted during the four days prior to his taking quina 0·662, 0·774, 0·585, and again 0·585 grammes of uric acid. Then he took 10 grains of quina, and on that day excreted 0·358, and on the next 0·387 grammes of uric acid. On the third day after he had taken quina the uric acid rose again to 0·670 grammes, and remained there stationary, amounting to 0·671, and 0·668 grammes on the two following days.

To the foregoing statement I have to add that in two of the experiments I have also determined the other constituents of the urine. The solids in general, and the urea, I found not materially affected under the influence of quina, but the phosphoric acid appeared to be augmented. However, these points require a good deal of further investigation, and I therefore abstain here from giving details.

I hope to read very soon that others have repeated the experiment, and that we shall thus get more materials towards arriving at the truth.

To those who might be inclined to repeat the experiment, I have to add one or two remarks. There are occasionally persons met with who, though apparently in good health, excrete uric acid with great irregularity, the maximum and minimum being widely separate from each other; such persons should not be used for the experiment, as it would be necessary in these cases to take the average of a great many observations in order to obtain reliable results. Moreover, it is advisable to take during the time of observation not too much fluid, as great dilution of the urine tends to make the determination of the uric acid less accurate.—*Med. Times and Gazette, May* 30, 1857, *p.* 537.

123.—*The Lead Wire Suture.*—Mr. Spencer Wells used it last week at the Samaritan Hospital in a case of vesico-vaginal fistula, in order to close a fissure which had remained after the partial failure of a previous operation. The edges of the fissure having been vivified, the wire was passed by a curved needle, the end of which is so made that the wire can be screwed into it. The wire is very soft and flexible, and as soon as it is passed the ends are twisted together by a pair of blunt forceps. These can be cut off at any length, and so doubled up on each other that no scratching or irritation is produced. Mr. Wells applied two of these sutures in the case just alluded to with the greatest ease, and the wire was twisted until the parts were brought into accurate apposition.—*Medical Times and Gazette, May* 30, 1857, *p.* 540.

124.—*On the Medicinal Effects of Ammonia and its Preparations.* By Dr. T. Ogier Ward.—Ammonia had never been considered to be a normal constituent of the blood, as its presence had not been detected except after death in cases of typhus, cholera, melæna, and other diseases of a putrid character, until Dr. Richardson's recent discovery that healthy blood owes its fluidity to the presence of ammonia, which is given off during its coagulation, which process may be arrested, and the fibrine re-dissolved, by the restoration of the alkali. An interesting enquiry here suggests itself: how does the ammonia escape from the body during the coagulation of the blood, and how is it retained in those instances in which the blood remains fluid after death? Assuming the truth of Dr. Richardson's views, Dr. Ward had examined and compared the therapeutic effects of the various preparations of ammonia. He had found that, whether applied externally or taken inwardly, they possess in common the property of dissolving the proteine elements of the blood, whether in the vessels or effused into the tissues. This similarity in the effect of ammoniacal medicines is owing to their ready decomposition, the ammonia being separated, and forming the chief curative agent, though it is aided by the other substances originally combined with it. Thus its stimulant and solvent action is similar in kind, if not in degree, when used either externally or inwardly in the form of gas, liquor ammoniæ, or combined with carbonic acid, &c. From the utility of these preparations in the treatment of venomous bites and stings, inflammatory swellings, diphtheritis, croup, &c., we may suppose that they will be equally efficacious in urticaria, erythema nodosum, and erysipelas, in which there is an effusion of the fibrinous elements of the blood. In these and other inflammatory diseases and conditions, it is probable that the benefit of the salts of ammonia is owing to their preventing or removing the effusion of fibrine from the inflamed parts. In this way, although the primary action of ammonia is stimulant, its remote effects are sedative or debilitant, as it not only arrests inflammatory action, but, by its resolvent and secernent power, carries the products of inflammation out of

the system, and hence its utility in all active febrile complaints. It is to this attenuating property that its use as an antidote to drunkenness and to the stupor of opium is to be ascribed. Its stimulant powers are of use in poisoning by hydrocyanic acid, in the cold stage of ague, and in the retrocession of gout, rheumatism, and the exanthemata, as well as in syncope, hysteria, epilepsy, and convulsions. The hydrochlorate, which is the least easily decomposed, is probably the most useful of the salts of ammonia, as it not only possesses the stimulant, resolvent, and secernent properties of the others, but owing to its combination with chlorine, is endued with tonic powers, by which its prolonged use, unlike that of the other preparations, is attended with invigorating effects both to mind and body; and thus it forms an excellent substitute for mercury in cases where this medicine is inadmissible from its tendency to produce cachexia.—*British Med. Journal, Feb.* 14, 1857, *p.* 137.

125.—*Climates free from Phthisis.*—M. Boudin, chief surgeon of the Roule Hospital (Military) at Paris, has just published a compendious work on medical geography and statistics, including endemic diseases. In this very remarkable book we find the following data on phthisis:—"There are countries where phthisis is unknown, as, for instance, Iceland, as stated by Dr. Schleisner; no phthisical patients are even seen in Finmark; and the Swedish physicians affirm that consumption becomes less common as we proceed northward; there is, in fact, such a thing as a preventing action of the polar regions. In England, statistics show that in the army the maximum number of deaths by phthisis is to be observed amongst the troops quartered in the United Kingdom; that this number diminishes in warm countries, and is lowest in cold climates. As to the civil population of Great Britain, it is found that in London the deaths from phthisis are 18 per cent.; in Edinburgh, 11·9; Leith, 10·3; and Aberdeen, 6·2. The English soldier is more often the prey to the disease in his own country than in any other. The mortality from phthisis amongst the military is lower anywhere else than in England, not only in the south, but more particularly towards northern climes. There are two or three times less cases of phthisis amongst the troops stationed in Canada than amongst those who stay at home. The preventive action of warm climates varies with the longitude; in the torrid zone, for example, the maximum corresponds to the West India Islands, and the minimum to Madras. The sea acts as a preventive of phthisis, and the deaths from this disease are more numerous in the army than the navy. The infantry of the line loses annually by phthisis in the United Kingdom 8·9 men per thousand; the guards, 12·5; and the mortality from the same disease becomes lower in the colonies. At Malta it is below 5 per thousand; in Gibraltar, 4; at the Mauritius and Ceylon, 4; at the Cape, 3; and in the Madras presidency, 1."—*Lancet, July* 25, 1857, *p.* 90.

126.—THE DECILLIONTHS OF HOMŒOPATHY.

[Mr. WHARTON, an able professor of mathematics and astronomy, has had the kindness to answer the difficult questions proposed below. His address is 7, Elm Terrace, Queen's Elm, Fulham Road.]

Q.—If homœopathists give, as they profess to do, the decillionth of a grain of medicine for a dose, and which decillionth can only be obtained by dissolving the grain of medicine in a decillion drops of some liquid—say alcohol—how long would the grain of medicine last, if the population of the world were a thousand millions, and if there were a thousand millions of such worlds, and if each inhabitant lived for a thousand years, and if they each took a dose per second during their whole existence?

And what must be the dimensions of the vessel that would just hold the decillion drops of alcohol?

A.—The number of generations, each subsisting a thousand years, that the grain of medicine would supply with the homœopathic dose to each individual per second, each generation consisting of the 1,000,000,000 inhabitants of the 1,000,000,000 worlds is 31,687,535,943,382,425,811,012,156,738,474; and the whole number of years the grain of medicine would last the inhabitants of those worlds is 31,687,535,943,382,425,811,012,156,738,474 × 1,000, equal to thirty one thousand six hundred and eighty-seven quintillions, five hundred and thirty-five thousand nine hundred and forty-three quadrillions, three hundred and eighty-two thousand four hundred and twenty-five trillions, eight hundred and eleven thousand and twelve billions, one hundred and fifty-six thousand seven hundred and thirty-eight millions, four hundred and seventy-four thousand years!!!

The time it would take the trillion inhabitants of the thousand million worlds, each counting 500 years per minute, without intermission, to count the *number of years* the medicine would last, is 120,494,090 years.

The vessel that would just hold the decillion drops of alcohol must have its length, breadth, and depth, each 229,995,079,096,540 miles long.

Light travelling 192,500 miles in a second, would require 378 years to travel the length of one of the sides of the cubical vessel that would just hold the decillion homœopathic doses of medicine.

The spherical space which contains the solar system would hold only a very small part of the decillion drops.

The length of the major axis of Neptune's orbit, and consequently the diameter of the sphere, is 5,706,893,200 miles, which light would travel over in eight and a quarter hours.

If the spherical space which bounds the solar system, vast as it is, was increased so as to have its diameter 40,300 times greater, it would be equal in length to a side of the cubical vessel, but would not, of course, hold the decillion drops; for if the sphere was put into the

vessel, it would touch it only at five points, or six if covered, and the angular spaces would be empty.—*Medical Circular, July* 29, 1857, *p.* 56.

127.—ON VOMITING—ITS VARIOUS CAUSES AND THEIR TREATMENT.

By Dr. Lees, Physician to the Meath Hospital, Dublin.

Vomiting may be divided, as to its causes, into—1st, Essential; 2nd, Morbific; 3rd, Mechanical; 4th, Sympathetic; 5th, Nervous.

1st. Essential vomiting is caused by some derangement in the natural secretion of the stomach itself, or by congestion, inflammation, or some structural change in that viscus; and may arise in every degree, from the simplest form of indigestion, to the most violent degree of inflammation caused by the action of irritant or corrosive poisons. In scirrhous degeneration, and in every form of ulceration of the stomach, whether simple follicular, perforating, or malignant, and also in that chronic softening of the mucous membrane, which often occurs in the advanced periods of tubercular phthisis, and which is considered by Dr. Budd to take place after death, from the action of the gastric juice, which has been excited by reflex nervous influence. But I do not agree in this opinion, for I think that the symptoms, in most cases, indicate a deranged condition of the mucous membrane of the stomach, probably an effect of the tubercular diathesis; and you will often find that a drop of creasote, or five to ten drops of medicinal naptha, with a few drops of compound tincture of cardamoms, will relieve it. Dr. Turnbull recommends in such cases a combination of bismuth with gallic acid and opium; and Dr. Seymour (late Physician to George's Hospital) gives four grains of extract of conium two or three times a day, followed by an ounce of lime-water. The treatment for the other forms of essential vomiting will of course depend on the causes that excite it, and which I have spoken of in the preceding lectures on these subjects; but, as a general rule, a proper regulation of diet is of the greatest importance, which should be given in small quantities, (in a liquid or pulpy form), and of the mildest kind. 2nd. Morbific vomiting, under which term I include every case caused by a morbid state of the blood, as we see in scarlatina, variola, erysipelas, purpura, pyæmia, cholera, yellow fever, jaundice, and other diseases, in which an effort is made to eliminate some "materies morbi" from the system, through the gastric mucous membrane. Dr. Budd has alluded to this form, but only with reference to granular degeneration of the kidney; but I think it is applicable to a much greater number of diseases, and deserving of particular attention for its diagnosis, prognosis, and treatment. The history of the case, the nature of the matters vomited, and the condition of the urine, will assist us in our diagnosis, when our treatment must depend on the nature of the case; but as a general rule we should keep up a good action of the skin at

the commencement, and in some cases act on the intestinal canal by purgatives, so as to try and expel the noxious material through that channel. 3rd. Mechanical. Under this head I would include those cases of vomiting which occur in consumption, bronchitis, and pertussis, simply from the violence of the cough causing spasmodic action of the diaphragm and other muscles; also cases caused by distension of the stomach from solid, liquid, or gaseous substances; or owing to pressure applied externally on this viscus by an enlarged liver or spleen, or even from stays being too tightly laced. Certain trades also, by requiring a stooping position, and so compressing the stomach, may cause it; and any mechanical obstruction to the passage of food out of the stomach, or during its progress through the bowels, will have the same effect; but in this latter case the peristaltic action of the intestines is sometimes inverted; their contents pass up into the stomach, and then we have what is termed stercoraceous vomiting; that is, matters vomited having the taste, colour, and smell of fæcal matter. This condition is most frequently met with in strangulated hernia, but also in that disease termed ileus, or, "passio iliaca," for which Dr. Seymour recommends two grains of calomel made into a pill with one grain of soft and recent extract of opium, and followed by soda water in active effervescence. In these cases you should try to determine towards the bowels, by means of calomel and aloes, with hyosciamus, and by enemata. If these fail, have recourse to galvanism, which I have seen followed by good results. The period of time (after taking food) at which the vomiting occurs, and the nature of the matters vomited, will be our guides in the diagnosis. 4th. Sympathetic, by which I mean a form of vomiting caused by disease or irritation in some part of the system remote from the stomach, which itself is free from disease. The nausea, in these cases, is generally very distressing; the vomiting very severe, and sometimes uncontrollable till the exciting cause is removed. In some cases the vomiting is merely symptomatic of irritation produced by a natural process, as in that which so constantly occurs in the early periods of pregnancy, which, though in most cases only a temporary inconvenience, the result of sympathetic irritation, yet occasionally becomes so constant and distressing, as to require every exertion in our power to control it, and in many cases has proved fatal; so that the induction of premature labour has been recommended by many eminent accoucheurs, as the only means of saving life. In a lengthened discussion which took place in the Academy of Medicine at Paris, in March 1852, M. P. Dubois (one of the most eminent practitioners in that city) discussed the question with great ability; and after proving the great danger of such cases, ten of which had proved fatal within his own observation, he advocated the practice of inducing abortion, even when there was fever present, as *post mortem* examinations have proved, that even in these cases, there is no evidence of inflammation, either in the stomach or in any other part; and he quoted many cases in which all vomiting and fever

had subsided, when the mother had ceased to feel the motions of the infant, which was expelled dead by the natural efforts, in some days after, when abortion occurred spontaneously. Vomiting is well known to occur as a symptom of disease in the brain, acute or chronic; but the history of the case, the pain of head, the dilated pupil, and the slow, labouring pulse, will generally put us on our guard respecting it The late Dr. Graves, of this city, has made some important observations on vomiting, as indicative of cerebral disease *in fevers*. He states, that whenever typhus fever, scarlatina, variola, or measles set in with severe vomiting, unaccompanied by distinct evidences of gastric inflammation, it indicates an approaching dangerous congestion of the brain: and "*in all feverish complaints, when, during the course of the disease, the stomach becomes irritable without any obvious cause, and when vomiting occurs without any epigastric tenderness*, you may expect congestion or incipient inflammation of the brain or its membranes." He considers that the very great quantity of bile vomited is characteristic of this form, which he termed cerebral vomiting, and which ought to be treated by leeches to the head, and other remedies for cerebral inflammation. Vomiting may be symptomatic of a calculus in the kidney or ureter, but the diagnosis is seldom very difficult, as the situation of the pain in the region of the kidney, or in the direction of the ureter—its sudden nature and intensity, coincident with severe vomiting, *but a quiet pulse*—will generally enable us to form a correct opinion; but in cases where the vomiting is caused by disease in the kidneys, without any calculus—or even if there be a calculus, and yet so situated as not to cause any pain or tumour—there is often great difficulty in the diagnosis. We must examine particularly into the previous history, and institute a careful inquiry into the present symptoms, as well as a minute investigation as to the state of the urinary secretion, before we can venture on any positive opinion. The following case, which occurred under my care, is a good example of this:—

William Clarke, a car-driver, was admitted into the Meath hospital for bronchitis. On going round the wards, I observed this man vomiting, and on inquiring as to the cause, he said he vomited constantly, and attributed it to his cough. On investigating the case, I found that he suffered from constant dull pain in the right lumbar region, with severe pains in his feet, and vomited every morning, but passed urine without any annoyance. He stated, however, that he was formerly a soldier, and that in Africa, twenty years ago, he contracted fever, and at that period suffered from some urinary affection, having occasional retention, with severe pain in the loins and region of the bladder. He was discharged, and gradually recovering, continued in good health till about six years since, when he was attacked with severe pain in the lumbar and pubic regions, accompanied by obstinate vomiting, which persisted for three days, when, after violent straining, he passed a small stone by the urethra. The urgent symptoms imme-

diately subsided, and he continued free from suffering till about three months since, when the symptoms of which he now complains made their appearance. The urine was found to be large in quantity, of a pale opaline colour, alkaline immediately after being passed; specific gravity, 1·007, albuminous. A copious deposit of white sediment subsided to the bottom of the vessel, while an iridescent pellicle floated on the surface. On submitting the urine to microscopic examination, large triangular prisms of the triple phosphate were seen, with amorphous phosphate of lime. I made the diagnosis of a calculus in the right kidney, and put him on a generous diet, with dilute nitric acid, and mild counter-irritation to the right lumbar region under which treatment he was progressing favourably, when unfortunately he was attacked with erysipelas of the face and fauces, which terminated in death. Both kidneys presented evidences of considerable congestion. In the right one, firmly embedded in its substance, there was a calculus the size of a lozenge, elongated, curved at its extremity; and the whole cortical substance of the organ appeared to be undergoing the process of granular degeneration. The mucous membrane lining the pelvis of the kidney and commencement of the ureter was of a dull white colour, and slightly thickened. The vomiting was caused, I feel confident, in this case, by the mechanical irritation of the tubular structure of the kidney, owing to the calculus; and in this irritation the stomach participated, through the influence of the splanchnic nerves, from which both the renal and gastric plexuses are derived.

Vomiting caused by the passing of a gall stone into the duct, is a good exemplification of the sympathetic form. It generally comes on with sudden, acute pain in the epigastrium or right hypochondrium, attended by distressing nausea, and vomiting of extremely bitter fluid; the pulse is quiet, but jaundice rapidly supervenes, and the pain often ceases suddenly; an indication, in most cases, that the calculus has passed into the intestine. In these cases, as also in those of severe vomiting, caused by the passing of a calculus from the kidney, you should give one grain of opium with one of aloes, and one of dried carbonate of soda, or from 30 to 60 drops of the solution of muriate of morphia every hour, till the pain is relieved; watching, lest narcotism be induced, though it seldom is while the pain lasts. In some cases I have given a drachm of chloroform with good effect. Dr. Prout recommended bi-carbonate of soda, in doses of one or two drachms, dissolved in a pint of warm water, to be drank repeatedly to allay the vomiting. I have found it useful, with the addition of two drops of dilute prussic acid to each dose. Vomiting also occurs sympathetic of ulceration of the os or cervix uteri, whether simple or malignant, in mere derangements of its natural functions, or in rupture of this viscus. It may also occur at the period of rupture of the aorta or heart. Dr. Corrigan has recorded two cases, one of a gentleman who was attacked with vomiting, which returned for three or four mornings successively, followed by the symptoms and signs of aneurism

of the abdominal aorta; and another case of a "lady who was seized after breakfast with violent vomiting and colicky pains, so as to give rise to a suspicion of poisoning; but on examination the heart was found ruptured." Bertin, in his work on diseases of the heart, gives a case of rupture of the heart in which severe vomiting occurred, and he attributes the rupture to the vomiting; but it is more probable that the vomiting and spasm were themselves only symptoms of the impression made on the nervous system by the sudden lesion of such an important vital organ as the heart. In the case of the late Dr. Ball, who died of rupture of the aorta, Dr. Aquilla Smith informs me, that vomiting was one of the first symptoms. Vomiting also occurs in diseases of the peritoneum, both acute and chronic, particularly in that form termed tubercular, in which the matters vomited often present a peculiar dark-green or bluish colour (described particularly by Dr. Seymour); and on dissection we find the intestines matted together, and studded over with deposits of tubercle. In these cases the preparations of iodine internally, and the ointment of iodine of lead rubbed over the abdomen, will be found of use. 5th.—Nervous vomiting, by which I mean a form induced by some modification of innervation of the stomach, or independent affection of the gastric nerves, unconnected with any change of structure, or apparent cause of irritation, in either that viscus itself or any other part of the system. We meet with examples of it occasionally in young persons of both sexes, who, without any assignable cause, or from the effect of some sudden or violent mental impression, vomit their food repeatedly; we also meet with it in females the subjects of hysteria. It is, I think, to this form particularly that we may refer most of the cases termed by Sir Henry Marsh "regurgitating," which peculiar condition he considers to be "*essentially* a neural affection," and of which he has given a highly interesting and important account in the 'Dublin Quarterly Journal' of May, 1851.

This form of vomiting often takes place without any warning, or even effort, being in some cases a species of regurgitation resembling the rumination of certain herbiverous animals; but at other times it is preceded by nausea, heartburn, and accompanied by severe retching. It may occur fasting, when a quantity of stringy matter or bile is vomited; or it may follow the taking of any food, when the chief part is rejected; and it is curious that the most indigestible food is often retained; and though the vomiting may continue for weeks or even months, yet the loss of flesh is not always corresponding, though in some cases patients have been greatly emaciated. It is generally caused by powerful mental emotion, particularly terror, and its duration is very variable; it may be cured in a few days, or last for months, with occasional intermission, and then ccase suddenly. It is very liable to relapse, but seldom if ever proves fatal. The treatment of this disease is often very difficult and uncertain; what succeeds in one case may fail in the next. A proper regulation of the mind is essen-

tial for the cure, but it is of great importance to keep the bowels open ; and some obstinate cases have yielded when a slight but continuous action has been kept up by mild aperient medicine. Dr. Parry mentions a case in which everything was rejected by the stomach, even a teaspoonful of cold water ; the patient was greatly reduced, when he advised half a grain of aloes to be given every four hours, moistened only by a few drops of liquid. This was retained, and acted on the bowels, when the vomiting (which had lasted for some weeks) ceased in two days. In other cases effervescing draughts with prussic acid or laudanum will succeed ; and in hysterical cases, assafœtida, valerian, creasote, will be found useful. When the patients are anæmic, the preparations of iron, quinine, calumba, and quassia may be tried. If there is pain accompanying it, give morphia, hydrocyanic acid, or belladonna. External applications are often useful, as blistering, and the blistered part dressed with muriate of morphia ; or excite counter-irritation by croton oil, or tartar emetic ointment. The diet should be carefully attended to ; in some cases it ought to be highly nutritive ; in others a milk diet would answer best. Dr. Barlow, of Bath, cured a patient who suffered from constant vomiting by restricting her to a diet consisting wholly of fresh-made uncompressed curd, on which she subsisted for several months, and recovered perfect health. There is a peculiar kind of vomit, termed, from its appearance, "barmy or yeast vomit," to which much attention has been latterly directed, in consequence of the discovery in it (by Mr. Goodsir), of curious organisms, which under the microscope appear as square or slightly oblong plates, divided into four equal squares by lines which cross at right angles in the centre, and are again subdivided, so as to resemble a wool-pack, and hence he has termed them sarcinæ ventriculi. They vary from the 800th to the 1,000th of an inch in the length of their sides, and under a high power present a light-brown or yellow appearance. Much discussion has arisen as to whether these bodies are of animal or vegetable nature, but Mr. Goodsir has decided that they are vegetable, belonging to the species called alga. The fluid vomited in these cases is exceedingly sour, slightly turbid, of a light-brown colour, but presents this peculiarity, that it begins to ferment immediately after its rejection, and becomes covered with a brown froth, like that on the top of fermenting wort, and it is in this brownish substance that these sarcinæ are mostly found, along with the torula or yeast plant. The vomiting generally occurs after meals, preceded by a burning pain in the stomach, and great flatulent distention. The presence of these microscopic plants indicate a dilated condition of the stomach, and fermentation of its contents ; and though much importance has been attributed to them, as causing the symptoms and constituting the the disease, yet the weight of evidence is in favour of their being merely consequences of certain morbid conditions of the stomach, accompanying a form of fermentation analogous to the *torula fermenti*. As far as we know at present, these organisms are harmless of them-

selves, but they are generally indicative of some obstruction at the pylorus, causing the retention of food in the stomach, or of very serious functional disease. Dr. Turnbull, who has written a valuable work on this subject, divides the cases in which these bodies are found, into four series or groups, according to their several causes. 1st. Cases in which the pylorus is obstructed by simple ulcers, or their cicatrices, or some other non-malignant disease. 2nd. Cases of cancer pylori. 3rd. Cases in which no disease of the stomach existed, but the pylorus was obstructed by displacement, or some other cause, as by an enlarged liver pressing on it. 4th, Cases of mere functional disease; but even in these cases there is generally some cause (though of a temporary nature) which obstructs the passage of food out of the stomach. It is essentially a chronic affection, and though it may occur in young persons, yet it is most frequently met with in the middle aged. The bowels are usually constipated, and the urine (in two cases that were under my care) was highly alkaline in the morning, and presented a copious deposit of triple phosphates, with phosphate of lime; while that passed on going to bed was acid, and left no deposit. In these cases want of sleep was much complained of, and I gave the tincture of lupuline, in drachm doses, with good effect. In most of the recorded cases crystals of oxalate of lime have been detected in the urine. As to the treatment for this affection, the detection of sarcinæ in the matters vomited gives us the practical information, that from some cause or another the food remains too long in the stomach, and is not properly digested; we should therefore regulate both the quantity and quality of the food, so as to prevent this delay in the stomach, and the liability to fermentation; tender lean roast beef or mutton, strong chicken jelly, beef-tea, or mutton broth, in small quantities at a time, will generally agree; milk, and soda-water, sago, arrow-root, and rice are also of use; all fermented liquors should be avoided, and if a stimulant is requisite let them have brandy mixed with cold water. Dr. Turnbull advises the use of unfermented biscuit instead of bread. The chief remedial agents are such as tend to prevent the fermentative process; of these the bisulphite of soda (introduced into practice by Dr. Jenner) is one of the most effectual, for as it is decomposed by almost any vegetable acid, he supposed that the sulphurous acid set free, would stop fermentation and destroy the sarcinæ. His conjecture was right, for the fermentation was checked and the patient much benefitted. It may be given in doses of ten grains to a drachm, three times a day, dissolved in water, as it is very soluble, and should be taken soon after meals, as that is the time that fermentation commences. Dr. Budd speaks highly of creasote; a minim in a pill, taken after each meal, will not only check fermentation, but often relieves the severe pain which accompanies it. He also recommends common salt, from one to two tablespoonfuls taken twice a-day, in half-a-pint of water. Alkalies have been used in very large doses by patients, of their own accord; but I think they only afford temporary relief, chiefly by neu-

tralizing the excess of acid generated in the stomach. In most cases, indeed, our treatment can be only palliative, as the causes of obstruction are generally incurable.—*Dublin Hospital Gazette, April* 1 *and May* 1, 1857, *pp.* 101, 134.

128.—ON THE TREATMENT OF DISEASE WITHOUT THE USE OF ALCOHOLIC STIMULANTS.

By John Higginbottom, Esq., F.R.S., Nottingham.

[Mr. Higginbottom believes alcoholic stimulants to be dangerous agents in no case admissible in acute disease, and rendering even chronic disease less manageable.]

Having now discontinued the use of alcoholic stimulants for more than twenty years in my practice, I am induced to bring the facts—the simple facts—before my professional brethren, conscious of the superior efficacy of the treatment of disease without their use, although I believe it to be contrary to the received opinion and practice of the profession, and I know by many it will be considered quite Utopian.

On the Treatment of Typhus Fever without the Use of Port Wine.—I was educated in the opinion that port wine was absolutely necessary in the low and sinking state of typhus fever; and in order to procure it for my poor class of patients, when I commenced practice, I was desirous of forming a wine depôt with the assistance of my benevolent friends. Soon afterwards, a singular occurrence happened in a village in Derbyshire. The typhus fever was prevalent, and it was observed that a number of the rich patients died, who had been treated with the *artificial* stimulus of wine, and that the poorer lived, who had little else but *natural* stimulants, pure air, pure water, and simple diet. The fact was so apparent, that it was a saying in the village—"The doctors were blamed for killing the rich, and the Almighty was praised for curing the poor." From this simple fact I was induced to try the experiment of treating typhus fever without wine. I had soon a very ample opportunity, for in the month of August, 1813, and the four following months, nearly one-half of my time was devoted to visiting patients with typhus fever in the parishes of Radford and Basford—villages extending from one to three miles from Nottingham.

I may observe here, that at that period the practice of medical practitioners contracting for the attendance on parishes was not prevalent, consequently they did not place themselves under the often degrading surveillance of the guardians of the poor.

My treatment of the fever was to secure free ventilation, cleanliness, and particular attention to the digestive organs; commencing with a full emetic dose of ipecacuanha, aperients, saline medicines, and, in the low state, a decoction of the Peruvian bark (quinine was not then known), and light, simple, nourishing diet.

After finishing my long attendance with this simple mode of treatment, I had only lost two patients. Both of them had wine given to them, unknown to me, by a family in the neighbourhood. I believe none of the other patients had any wine; I know they had none from the parochial authorities, and I could not learn that any was obtained from any other source. In one family alone, of the name of Dawson, the father, mother, and seven children were all down of the fever at the same time. A nurse from the workhouse and an orphan girl they kept (who did not take the fever) were their only nurses; no neighbour durst approach them. I have not prescribed or recommended wine in typhus fever since that time, now upwards of forty years, and my treatment has been attended with eminent success.

During the autumn of 1848, typhus fever was prevalent in Carrington, a hamlet near Nottingham. The disease was fatal in some cases. I attended, conjointly with my son, twenty-seven patients at one time; several of them had bad symptoms; great depression, delirium, intermittent pulse, &c. The same early treatment of the disease was pursued in the commencement of the fever as before stated; in the low and sinking state, the sulphate of quinine, with the compound infusion of oranges, was given three times during the day, and the strength sustained by mild nourishment, a little given at very frequent intervals night and day; and the result was most successful—all the patients recovered. I believe the wine treatment would have been fatal to several of them. There is no doubt patients often recover in typhus fever, in spite of the wine given, although, *in my opinion, and from my long practice and observation*, its administration in typhus fever has always been injurious, and often fatal in its effects.—*Lancet, Aug.* 15, 1857, *p.* 166.

129.—ON THE ANALYSIS OF STRYCHNIA.

By Ernest P. Wilkins, Esq., Newport.

[In the case which is the subject of these experiments, the patient with suicidal intent took three grains of strychnia. This produced violent convulsive attacks, in one of which he died, six hours after the ingestion of the poison, from asphyxia caused by spasm of the respiratory muscles.]

I forwarded the stomach with its contents (undisturbed) and other viscera (and some blood) to my friend, Dr. Marshall Hall. This he forwarded to Professor Taylor, who has taken the trouble to make an analysis. In a letter to me, he says: "I have waited, however, in order that you might know the results obtained in Edinburgh and Dublin, as well as in London; and I only received the report of Dr. Christison and Dr. Douglas Maclagan yesterday morning. We have all three, acting independently, used a process known as that of Stas of Belgium, which has been found quite inadequate to detect strychnia in the bodies of animals poisoned by a quarter of a grain.

"Dr. Geoghegan, professor of medical jurisprudence in the Royal College of Surgeons, Ireland, made a minute analysis of the kidney. He reports that, with the greatest care, he could not detect the slightest trace of strychnia by any one test or property. On subsequently adding a minute portion of strychnia to the residue, it was immediately revealed.

"Drs. Christison and Douglas Maclagan had the portion of lung and liver which you sent. They have examined both, and report as follows:—'The result is, in one word, wholly negative. We worked by Stas' method; everything went smoothly with the manipulations; and eventually not only did the bichromate of potash fail to give any reaction of strychnia, but in no stage of the process—alcoholic, watery, or ethereal—was there the faintest trace of bitterness,' &c.

"I had the assistance of Mr. Scanlan, a good pharmaceutical chemist, who has manufactured the alkaloids. We occupied three weeks in our analysis, operating on, 1st, the blood; 2nd, the heart; 3rd, the coats of the stomach; 4th, the contents of the stomach.

"In the three first there was not the slightest trace of strychnia, either by taste or by any of the tests. In the dry residue from contents of the stomach we obtained, by one colour test, a slight purple passing to a red colour. The liquid, however, had rather the bitter taste of caramel than strychnia. No crystals of strychnia could be procured. Hence, but for the fact that we knew diseased had died from strychnia, we should have placed no reliance on this result. In short, when a man's life depended on the answer, I should decline to say that such a result was conclusive of the presence of strychnia.

"I may remark that your case was particularly favourable to the discovery of the poison in an *absorbed* state, if it admits of unequivocal discovery, as the man lived five or six hours, during which time there would have been a much larger deposit (if any) in the tissues, than would occur where death took place in an hour or two.

"You have here, then, the results of men who have been many years engaged in these researches for poison, who can have no interest whatever in altering or suppressing facts, or stating anything but the truth; and, further, the case was one which, above all others, should have shown the 'absorbed' poison, if it could be shown, and the result is this:—A man may die from strychnia; some of the poison may or may not be found remaining in the stomach according to dose and other circumstances, but not a particle of the poison, in an absolute state, will be found in other parts of the body!"—*Lancet*, *May* 30, 1857, *p.* 551.

130.—*On the Detection of Strychnine.*—Many men have been working with zeal and diligence to open out this obscure subject; but, while honouring all for their motives and such knowledge as they have been enabled to contribute to the general stock, it so happens that

circumstances have placed us in a position to watch more closely and continuously the proceedings of, among others, Messrs. Rodgers and Girdwood. These gentlemen have endeavoured to fulfil the conditions we felt ourselves justified in demanding before giving an assent to any conclusions; and it is with satisfaction that we proceed to report, in great measure as eye-witnesses, an outline of their experiments and results, without, however, pledging ourselves to maintain the absolute correctness of the inferences drawn from them. We know, indeed, that grave objections may be taken to some of the material points. These we shall examine more especially in a future number. Our express purpose now is, by giving an exposition of the actual condition of this serious controversy, to stimulate to fresh efforts for its final settlement before another occasion arises for the public exposure of professional differences, which only require due scientific diligence for their determination.

The questions presenting themselves for solution were these: Can strychnine be detected after death, when it has been administered in a dose only sufficient to destroy life? or is it so altered in the process of destruction of life, and subsequent decomposition of the tissues, as to cease to be strychnine? The answer of Messrs. Rodgers and Girdwood to these questions is contained in the following summary of conclusions, derived from an extended series of experiments:—

"1. That the opinion that strychnine can only be detected when the poison is in excess, is untenable, and not supported by trustworthy analyses.

"2. That the opinion, that strychnine is decomposed in the process of destruction of life, has no better foundation.

"3. That strychnine can always be detected, when it has occasioned death, in the blood, organs, and tissues of the body, quite independently of the contents of the stomach.

"4. That it is found unchanged in the urine.

"5. That the delicacy of the reactions of strychnine, and its extraordinary stable qualities, render its detection more certain than that of any other poison."

These results are based upon experiments, of which the following are illustrative examples:—A rabbit was poisoned by five successive doses of strychnine, each containing one-thirtieth of a grain. Death followed in about three hours after the first dose, and within half-an-hour after the administration of the last; only one-sixth of a grain was given altogether. The contents of the stomach yielded strychnine in abundance. Half-a-pound of the flesh did the same. It was also discovered in the bones and in the urine.

The blood and contents of the stomach of a dog poisoned by two grains of strychnine were, after putrefaction, subjected to analysis, both yielding strychnine.

The muscles, viscera, and bones of a dog poisoned by a grain of strychnine, were separately subjected to analysis, thirteen months after interment. Strychnine was discovered in every instance.

The viscera, and contents of stomach, of a rabbit poisoned by half a grain of strychnine and five grains of tartar emetic, yielded antimony and strychnine also in each analysis. The body of this rabbit was allowed to decompose, in contact with air, for nine months. When dry, the bones separated, and although the other tissues were almost pulverulent, no difficulty was found in showing the presence of strychnine.

The essential conditions of the process by which these results are arrived at by Messrs. Rodgers and Girdwood, are—that it should be capable of disintegrating the substances in which the strychnine is present so completely that it cannot escape solution, and that it should leave the strychnine in a state of perfect freedom from foreign organic matter. These conditions have not been secured by previous experimentalists. Hence their contradictory statements.

The process itself is as follows:—The substance to be operated upon is digested with dilute hydrochloric acid, 1 to 10, until it is apparently fluid; the liquid is then filtered and evaporated to dryness over a water-bath; what remains, treated with spirit as long as anything can be dissolved, and the filtered tincture evaporated as before. The residue must now be dissolved in water and filtered.

This aqueous solution is to be rendered alkaline by ammonia and agitated in a bottle, or long tube, with about ½ an ounce of chloroform. After subsidence, the chloroform is drawn off by means of a pipette, transferred to an evaporating basin, and expelled over a water-bath; the residue left on the basin must then be moistened with concentrated sulphuric acid, and exposed for some hours to the temperature of a water-bath, by which proceeding, all organic matter except the strychnine is destroyed. The charred mass is then treated with water, and the solution filtered to separate the carbon; excess of ammonia is added and the solution again agitated with about ½ drachm of chloroform. If, on evaporating a small portion of this chloroform solution, and acting upon the residue with concentrated sulphuric acid, any charring takes place, the foregoing process must be repeated.

The chloroform solution now obtained will afford strychnine sufficiently pure for conclusive testing. For this purpose, a small quantity is taken up in a capillary tube, and evaporated by adding successive drops, on the smallest possible space of a warm porcelain capsule. If the quantity of strychnine in the solution is large, say the 1-2000th of a grain or more, the method pursued in using the re-agent is similar to that adopted by others, viz., moistening the spot, when the capsule is quite cold, with concentrated sulphuric acid, and then adding a minute fragment of bichromate of potash. When, however, the quantity is very small, no colour will be perceived by this mode of testing. Under such circumstances, sulphuric acid, rendered slightly yellow by chromic acid, is said to be found successful.

We may, in conclusion, enjoin a caution against two sources of failure in conducting this test. The common recommendation to use

the spot moistened with sulphuric acid, with a glass rod before the addition of the bichromate is to be avoided, because the acid sulphate of strychnine may so be removed altogether; and the operator must be careful not to expose the matter under examination to an intense light, as in his anxiety to watch the colour changes he is too apt to do, the effect of light, in more than moderate amount, being to suspend the chemical reactions.

We cannot exaggerate the importance of these statements to the medical jurist; but we regard as of much more importance the extensive spread of information respecting the certain detection of this poison as a means of correcting a popular delusion that strychnine is an agent which the evil-tempted may employ with comparatively small risk of conviction. Let every one, in his sphere, do his part in the prevention of crime.—*Med. Times and Gazette, June* 20, 1857, *p.* 619.

131.—*Instrument for Clinically Determining the Amount of Sugar in Diabetic Urine.* By Dr. A. B. Garrod.—The instrument, named a *Glucometer* (manufactured by J. Coxeter, Grafton Street East), is constructed upon the fact, that glucose or diabetic sugar, when boiled with a solution of carbonate of potash, gives rise to an amber colour, and that the tint is in proportion to the quantity of sugar. The apparatus consists of a standard, a graduated tube of the same calibre as the standard, and an accurately divided minim measure, the standard being filled with a solution of the exact tint produced by a known quantity (half a grain) of the diabetic sugar to the fluid ounce. The following is the method of using the glucometer:—A small quantity of the urine, say half a fluid drachm, either previously diluted or not, according to circumstances readily ascertained, is to be accurately measured in the small minim tube, and mixed with the same bulk of a solution of carbonate of potash of a given strength, and after the measure has been washed out with a drachm or two of distilled water, the whole is to be kept at the boiling point over a spirit-lamp for five minutes, either in a large test-tube, or, still better, a very small flask. After cooling, the coloured liquor should be transferred to the large tube, and distilled water added until the tint exactly corresponds to that of the standard,—a process which may be readily effected by holding the tubes side by side, directing them to a moderately bright light. All the required data for determining the amount of sugar are now obtained. Suppose, for example, that the half drachm of urine employed in the quantitative analysis requires to be diluted so as to occupy six and a half drachms before the standard tint is obtained, such urine would contain six grains and a half of sugar per ounce. Again, suppose the urine had been diluted with three times its bulk of water before being employed in the glucometer, which, when the urine is rich in sugar, may be necessary, in order to prevent the graduated tube being of inconvenient length, then it is only required to multiply

the amount of sugar by four to obtain the total quantity in the original urine. In the above-named experiment it would therefore be twenty-six grains in each fluid ounce. Dr. Garrod expressed a hope, that by means of the glucometer the clinical determination of sugar might become a matter of little difficulty, and capable of being effected by any one engaged in the practice of medicine; and he also considered that such determinations might prove of great value, not only in ascertaining the amount of disease under which any diabetic subject might be suffering, but also the value of various articles of diet and of different remedies in the treatment of this disease.—*British Medical Journal*, *Oct.* 31, 1857, *p.* 912.

132.—*On Chloride of Gold and Sodium employed as a Solvent in the Treatment of certain Tumours.* By Dr. Rouault.—The author of this communication relates some cases observed by Dr. Debreque and himself, in which it was found that the preparations of gold possess a special elective action in the treatment of glandular tumours. In chronic adenitis in general, and particularly in cervical adenitis, the solvent properties of the preparation alluded to appeared even more energetic and certain than those of iodine. One of the circumstances favourable to its employment is the presence of several tumours, separated or united in the form of a chaplet, or of ganglionic knots. The author remarked that its efficacy was less evident when there existed only a single ganglion, the resolution of which then only takes place with extreme slowness, and often not at all. Gold is also useful in benignant tumours of the breast, such as simple engorgement, hypertrophy, and sub-inflammatory tumours; and it also appeared to Dr. Rouault to be undoubtedly efficacious in certain tumours which were evidently of a malignant nature. The chloride of gold and sodium was the preparation generally employed, being combined with starch and gum arabic, and made into pills. With one of these pills friction was made every evening on the tongue, the gums, and the inside of the cheeks. The friction should be employed for some minutes, and the patient ought not to spit, so as to swallow any remains of the matter which is rubbed in. This plan is to be followed for at least six weeks. Several cases are related in which this plan appears to have been attended with success.—*British and Foreign Medico-Chirurgical Review*, *July* 1857, *p.* 228.

133.—ON THE PREPARATION AND THERAPEUTICAL EMPLOYMENT OF SUBCARBONATE OF BISMUTH.

The following is the mode of preparation of the subcarbonate of bismuth described by M. Hannon, Professor at the University of Brussels. The bismuth is first purified by melting this metal in powder with ten times its weight of powdered nitre. After cooling, the

metal is again powdered, and mixed with ten times its weight of nitre, and after a second fusion the bismuth may be considered as entirely free from the arseniurets and sulphurets which it almost always contains. Then three parts of nitric acid are put into a retort, and one part of pure bismuth is added. When the reaction is complete, about a third of the liquid is evaporated, then the solution is poured drop by drop into a solution of carbonate of soda, and a white precipitate is obtained, which is subcarbonate of bismuth. The precipitate, after having been washed five or six times with distilled water, is thrown upon a filter, and washed again to remove the last traces of carbonate of soda. It should be preserved in well-stopped bottles. The physiological properties of the salts of bismuth are very little known, for the simple reason that the subnitrate is the only salt which has been employed in medicine. The operation even of this salt is not well understood, as its insolubility offers an obstacle to the observation of the physiological phenomena which might have been observed in the other salts of bismuth, such as the citrate, the tartrate, the acetate, or the carbonate. It is also the insolubility of the subnitrate which renders it inefficient in the greater part of the cases in which it is indicated; and it also occasionally produces a very inconvenient sensation of weight at the stomach. The subcarbonate is soluble in the gastric juice, its action is rapid, it produces no sensation of weight at the stomach, it rarely constipates, colours the stools less than the subnitrate, and may be employed for a long time without oppressing the stomach. The action of the subcarbonate appears to be sedative during the first days of its employment, and subsequently to excite all the phenomena which result from the action of tonics.

As to its therapeutical action, it may be noted that all cases of gastralgia consecutive upon phlegmasia of the digestive passages, cases in which the tongue is red and pointed, and cases in which the digestion is laborious and accompanied with putrid or acid eructations, or in which there is a tendency to diarrhœa or spasmodic vomiting, demand the employment of the subcarbonate of bismuth. This salt is also required in the vomiting of children, whether caused by dentition or succeeding to frequent fits of indigestion, and in the diarrhœa of weak children, especially when occurring at the time of weaning. One great advantage possessed by the subcarbonate of bismuth is, that it neutralizes the acids in excess which are found in the stomach. The subnitrate, as is well known, fails always in this respect. In all the cases where the subcarbonate has been taken, the pain in the digestive passages is first found to disappear; then the eructations cease, together with the vomiting or diarrhœa; the digestion becomes less and less laborious, the tongue gradually receives its normal form and colour; and if the use of the subcarbonate is continued, the appetite increases from day to day, the yellow tint of the countenance disappears, and the face becomes coloured at the same time as it ceases to be shrivelled.

The subcarbonate of bismuth is perfectly insipid, and excites no repugnance. It is given before meals. Adults take it in a little water, and children in honey. It may also be made into lozenges. The dose for adults is from one to three grammes, taken three times a day, in increasing doses.—*British and Foreign Medico-Chirurgical Review, July* 1857, *p.* 229.

134.—*On Incurvation of the Toe Nail.* By Henry T. Chapman, Esq., Lower Seymour Street.—[Mr. Chapman has pursued the following plan of operation successfully for many years, but little pain being caused to the patient by it.]

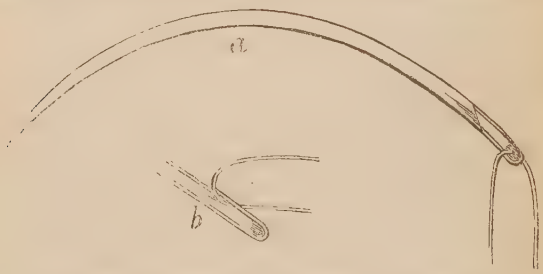
One-third or more of the nail, from its matrix to its free edge, is first divided by a succession of cautious strokes, with a small stout narrow-bladed scalpel, to avoid wounding the subjacent corium. The knife used for the subcutaneous section of tendons is very well adapted for this purpose, and we may safely rely on the patient giving immediate notice when this sentient structure is reached. The groove through the nail being completed, its free edge is seized by a ciliary forceps, and separated by a few touches of the scalpel from the cuticle uniting it to the tip of the toe. The sheath of cuticle binding down its radical extremity is also raised with the point of the knife. It is easy, then, by a turn of the forceps, to evert the divided edge of the smaller portion of nail sufficiently to introduce the point of the scalpel horizontally beneath it, when, by scraping the under surface of the nail, its connexion with the corium is gradually severed quite up to the matrix, to which alone it should remain attached. A little gentle traction to and fro will now generally complete its removal, and should the process have been attended by any pain or bloodshed, it is commonly so trifling that the patients have invariably walked away, exhibiting scarcely a trace of the limp with which they entered.

During the growth of the new portion of nail I direct the patient to keep the end of the toe constantly protected by a dressing of some mild ointment thickly spread on lint, in order to soften the nail, and prevent it from becoming rugged. furrowed, and perhaps once more incurved.—*Med. Times and Gazette, Oct.* 10, 1857, *p.* 382.

135.—NEW NEEDLE WITH OPENING EYE.

In the operation now coming into fashion for the relief of prolapsus of the uterus, vaginal cystocele, and rectocele, by perineal suture, as revived by Mr. Baker Brown, since practised by Dr. Savage and Mr. Spencer Wells, and more recently performed by Mr. Fergusson and Mr. Erichsen, some little delay and difficulty have been caused by the needles used for passing the deep sutures intended to support the quills. Mr. Brown and Dr. Savage use the common needle fixed on a

handle, which is passed through both lips of the wound made by the removal of skin and mucous membrane. This needle is not passed very easily, and there is a little difficulty in holding the thread with forceps, and withdrawing the needle. Mr. Fergusson avoids this by using a common curved needle; but then he has to cut off his thread, and to tie a knot to form the loop which is destined to support the quill. In order to avoid this loss of time, Mr. Spencer Wells has contrived the needle shown in the annexed cut (*a*). It possesses all the advantages of the open eye needle, without the disadvantages of the



latter, namely, the possibility of impediment in passing it, and the probability that the thread may slip out. To all appearance the eye resembles that of an ordinary needle, but one side of it, as shown here, (*b*) is made to open, so that the thread can be drawn out, the side closing again instantly by its elasticity. Needles on this plan will probably prove useful in other operations. Those used by Mr. Wells have been made for him by Messrs. Whicker and Blaise, of St. James's-street.—*Med. Times and Gazette, May* 30, 1857, *p.* 540.

136.—*Plaster of Paris Bandage.*—[This bandage is used at University College Hospital.]

It is intended as a substitute for the starch bandage in ordinary use at present, the advantages attributed to it being that it dries much more quickly, and is lighter. The former quality causes it, as is said, to sit more accurately, as the patient finds it easier to maintain the same position during the shorter period, so that it is free from the creases which are apt to be produced in the starch bandage by involuntary movements; and the patient is ready to be moved much sooner than when the starch is used. This is a point sometimes of importance in military practice. The bandage was applied at Mr. Erichsen's desire by Mr. Gamgee, who had seen it used abroad. It is said to have been in much favour with Pirogoff at Sebastopol. It is made by rubbing dry plaster of Paris well into an ordinary bandage: a number thus prepared can be kept ready for use. The patient's limb is

first enveloped in a roller, and over this the plaster of Paris bandage is applied, slightly wetted (to prevent the plaster from shaking off). As each turn is laid on it is more thoroughly moistened, and then lies quite evenly and comfortably. At any part where more support is required, additional strips of the same can be laid on and supported by turns of the principal bandage.—*British Medical Journal, Feb.* 14, 1857, *p.* 127.

137.—ON THE THERAPEUTIC USE OF OXYGEN.

By Dr. S. B. Birch.

[The use of oxygen, although chemical science tells us decidedly that it ought to be a most valuable remedial agent, has been much overlooked or ignored by the profession; perhaps partly from its employment involving some trouble and loss of time to the practitioner, partly from the experiments hitherto tried as to its therapeutic properties having been in inappropriate cases, or not properly performed. A gentleman with some hereditary strumous tendency, who had been the subject of secondary syphilis for seven years, consulted the author last year. His constitution seemed greatly shattered from the effects of disease and mercury combined, and reduced still more by severe hydropathic treatment.]

I found him extremely weak and anæmic, his powerful and muscular frame completely relaxed and attenuated; the skin throughout the body was quite blanched, and so transparent as to show deeply beneath the surface *general* dirty-looking congestion, with occasional spots of complete purpura. Some caries of one superior maxillary bone was observed, extending from the alveolar processes of the molar teeth. He suffered much from cerebral irritation, the eyes being suffused, intolerant of light and almost useless, with chronic iritis, and some effusion of lymph of low organisation. Pulse from 100 to 112, very small, almost imperceptible; tongue white and relaxed; and, although the weather was tolerably warm, his vital powers were so low as to render it almost impossible to generate sufficient animal heat to keep him alive, the extremities being cold and clammy. In fact, universal prostration and torpidity of function prevailed; and I ought to add that he had a suspicious, short, hacking cough (which had existed some months), with profuse nocturnal perspirations, but no well-marked physical signs of tubercular deposit. Upon examination of his legs, a very large ulcer was seen on one calf, and a little ulcerated point, communicating with a small but deep cavity, on the other. The larger one, he informed me, had commenced in a little spot about a fortnight previously, and had for some days been spreading very rapidly, causing much severe pain and constitutional irritation. It now presents the peculiar appearance of a sloughing mercurio-syphilitic ulcer, exactly circular, about two inches in depth, considerably ex-

cavated; the whole circumference, for the distance of an inch and a half or two inches from the edges, is hard, red, and extremely sensitive; there is a discharge of dirty-looking sloughy matter and acrid sanious fluid.' In spite of the vigorous and judicious measures advised by an eminent London surgeon, who had been consulted a few days previously, the sloughing ulceration is rapidly extending; and in the excessively prostrated condition of the sufferer the case appears by no means hopeful.

Here an opportunity offered of severely testing the power of oxygen; and knowing what this therapeutic agent could effect in analogous non-syphilitic ulcers, and in most cases of extreme debility and languid circulation, I at once determined energetically to bring it into action. My patient was ordered to preserve the horizontal position, and to foment, poultice, &c. The same afternoon I administered a large dose of the gas, which had the effect of making him feel more comfortable. The following morning, the ulcer still alarmingly progressing, I carefully superintended the administration of the largest quantity that could be borne, and ordered a moderate inhalation in the evening. From that time it spread no further, and by daily watching my patient during the succeeding fortnight I had the satisfaction to witness the separation of the dead portions, the perfect cleansing of the whole surface (the muscle being left exposed for some distance, and its movements being seen at the bottom of the cavity), and the gradual filling up of the depth with granulations; while at the same time the appetite returned, and the capillary circulation, with the entire nervous system, began to regain tone. Small doses of iodide of potassium were now ordered three times a day, and nutritious but moderate diet with porter; cod-liver oil was rubbed into the chest twice a day, and tepid daily sponging of the whole body was enjoined. In five weeks he was able to walk about, and in seven weeks entire healing of the large and deep excavation resulting from the ulceration had taken place, permitting him with his increase in strength to walk without difficulty many miles. He now left town, taking with him a supply of condensed oxygen, with a strict direction to continue his moderate inhalations, the iodide of potassium, and the cod-liver oil externally, and to communicate with me by letter once a week. Three weeks afterwards, having walked rather too much, and having otherwise irritated and injured the place on the *other* leg, where the small point of ulceration had apparently healed under the influence of the oxygen *without sloughing*, he thought it advisable to return to London. I found an ulcer of moderate size, much inflamed from irritation, rubbing of his trousers against it, and neglect; moreover he had caught a severe cold, and his cough (which had never left him), with profuse perspirations at night, caused much disturbance. He was feeble and *extremely* sensitive to cold, although the weather was warm. I gave him stringent directions as to quiet for his leg, largely increased his quantity of oxygen at each inhalation night and morning, continued his other

constitutional treatment as above mentioned for the specific diseases, and watched him closely by means of two long daily visits. He again progressed most satisfactorily, and was soon enjoying his favourite pedestrian exercise.

Steadily continuing his treatment, he towards the middle of September had entirely lost his consumptive cough and nocturnal perspirations, had fully regained his nervous tone, and had recovered his flesh; he suffered no longer from cold and languid circulation; the dirty congested appearance beneath the cuticle had quite disappeared; the jaw (from which there had been some exfoliation) seemed quite sound, and the general cerebral irritation with iritis had for some weeks ceased to evidence itself, the effused lymph having undergone complete absorption, and the membranes and chambers of the eye being quite clear and free in their movements.

About the end of October, this gentleman—an ardent disciple of Nimrod—wrote for permission to follow the hounds again. With a caution, I acceded to his request; and I have since learnt that he rode very hard during the hunting season without any return whatever of his former protracted disease. A few days ago, I may add, I heard some further account of him, and he is now stouter and stronger, and altogether in more robust health, than (he thinks) he ever recollects.

It is especially worthy of remark, with this interesting case in retrospect, that there exists probably no remedy at all comparable with oxygen as (in common parlance) a "purifier of the blood," when judiciously administered. My own experience particularly points to its well-marked and energetic action upon the general capillary circulation and upon the skin; in most cases, it powerfully promotes the healthy secretions of the latter, and it enables it to throw off an immense amount of morbid and poisonous matters; and, unlike all other medicines, while performing this duty, it produces no weakening or other untoward effect, but, on the contrary, simultaneously acts as a general tonic to the entire constitution. It will be observed that I ordered, as an *essential* adjunct to treatment, tepid sponging of the whole body daily, the poisonous *débris* cast off with the aid of the gas, and accumulating on the skin, obviously necessitating either such sponging or the use of the tepid bath. It also merits a passing notice how quickly the heroic doses of the gas, temporarily and carefully given, demonstrated the power of this therapeutic in cutting short and arresting the progress of rapidly-spreading ulceration.

I will give a second case, very briefly, from memory, so as not to lengthen my present paper too much.

A. B——, a policeman, aged thirty-six, had been nearly three months under skilful medical treatment on account of inveterate boils and carbuncles, which, appearing in continuously successive crops, resisted every remedy. At length he was advised that medicine could do no more for him, and that he must get immediately into the country, for the purpose of trying what that change could effect. He was

at this time covered with from twenty to thirty specimens of this very painful eruptive disease, and his health was necessarily much undermined from acute suffering and constitutional irritation. Being accidentally met with, he was offered gratuitous treatment under oxygen. Having a family to provide for, he could ill afford to leave them, and therefore thankfully accepted the proffer. He at once commenced a daily inhalation, and so rapid was his progress that in from ten days to a fortnight all the eruptions had entirely disappeared, and the unhealthy constitutional condition was so completely overcome as to render the cure permanent.—*Lancet, Aug.* 1, 1857, *p.* 112.

138.—*Valerianate of Ammonia in Neuralgia.*—For some time back, Dr. O'Connor has been prescribing with success, the valerianate of ammonia in cases of neuralgia under his care at the Royal Free Hospital. It has also been given in a few cases of epileptoid disease. In one case of paralysis of the facial nerve which did well, there was considerable pain along its course, sometimes of a very excruciating character. The valerianate of ammonia was administered with benefit, and in a very short time the patient got well. This remedy has been freely used in the Parisian hospitals, but especially at the Salpêtrière and the Bicêtre; and Dr. Tuffnell, Professor of Military Surgery in Dublin, has also tried it, and found it eminently successful. [An article on this subject will be found at p. 21 of our last volume.—Ed.] —*Lancet, Aug.* 1, 1857, *p.* 117.

139.—ON THE PRACTICE OF "ECRASEMENT LINEAIRE."

By R. J. O'Doherty.

[The author has repeatedly employed the écraseur in the removal of tumours in the anal region, especially hemorrhoidal, he considers this instrument does away with the difficulty previously experienced in the treatment of these cases.]

Before employing the écraseur in the removal of hemorrhoids, M. Chassaignac impresses the necessity of having the patient completely under the influence of chloroform. Indeed he admits that without this the successful performance of the operation would be impossible. No human being, however courageous, could endure the pain attending it without more or less writhing and contortion, which would be fatal to the success of the operation.

Having accomplished this essential preliminary, he proceeds in the following manner:—Gently turning the patient upon his left side, and flexing the right leg upon the thigh, and the thigh on the pelvis, he brings the parts fully within his command. He first passes into the rectum his "Erigne," having the hooks sheathed, introducing it sufficiently deep to be certain of grappling the entire tumour, he un-

sheathes it and draws it forcibly out, of course carrying with it the hemorrhoidal mass. He then includes the entire within a firm twine ligature, and round the track of this latter he places the chain of the écraseur, which he proceeds to shorten until it constricts the tumour. At this period he desires an assistant to note the time, and to make a sign to him as every fifteen seconds elapse—on every such sign he tightens the chain until the click is heard. As a general rule, the tumour will be separated in a space of time varying from ten to twenty minutes, leaving an almost bloodless surface, on which the track of the wound will be scarcely discernible. The after-treatment consists in graduated pressure retained firmly against the anal opening by means of the usual perineal bandage; the patient is removed quietly to bed. Of course precautions are taken before operating to have the bowels cleared, and in such a condition that a motion will not take place for seventy-two hours after. M. Chassaignac considers it of much importance to secure this, and with that view gives strict injunctions respecting the patient's dietary, confining him to food of the simplest kind, and especially interdicting vegetables, or anything calculated to generate intestinal gases, &c.

In one of his earlier operations he found, from not having adopted proper precautions, that the wounded surfaces of the intestine became partially adherent in the process of healing, thereby most disagreeably complicating the operation by a partial stricture of the rectum. This accident he now always prevents by the following method, which I quote from the appendix to his memoir:—

"On the day following the operation I introduce a catheter into the intestine with much gentleness. I renew this manœuvre the two following days, after which I daily introduce an elastic bougie, each of larger calibre than the preceding one, taking care to have them well greased before introducing them."

The wound will heal by granulation, and M. Chassaignac affirms, and certainly, as far as I could judge, with perfect truth, that the amount of suppurative inflammation will be comparatively very slight. In favourable cases it will be healed in a fortnight.

Rectal, Uterine, and Nasal Polypi.—The employment of the écraseur in these forms of tumour needs no remarks from me, as it is evident how admirably it is adapted to the operation of removing them. I shall, therefore, simply state that in numerous cases of one or other of them, in which I saw it used, the result was everything which the surgeon could desire.

Anal Fistula.—Next to the class of hemorrhoidal tumours, I should be inclined to place this affection as "fit and proper" for this instrument. In the operation for fistula it in truth fulfils every indication that could be wished. In all the cases in which I saw M. Chassaignac use it, the section of the parts was effected without any hemorrhage whatever, and the wound inflicted by it was precisely of that description most desirable in these cases; the amount of contusion of

the parts necessarily caused preventing the possibility of the wound healing in any other way than from the bottom; and the comparatively small amount of suppuration, which M. Chassaignac claims as one of the results most characteristic of the action of the écraseur, will be found of no slight importance in the cases of debilitation and broken-down patients ordinarily afflicted with this complaint.—*Dublin Quarterly Journal, August*, 1857, *p.* 126.

140.—*On the Ecraseur.*—Although still employed occasionally by some surgeons, the écraseur appears to be rapidly falling into disuse in London. Though by no means warm admirers of the instrument, we almost fear that it is being discarded somewhat prematurely, the trial given having not been quite a fair one. From Paris we still hear reports of its very extensive employment, and of its being deemed one of the most valuable of modern improvements. That its use there has been too indiscriminate, and that its recommendation for some really absurd purposes has tended much to damage its English reputation, there can be no doubt. Still, however, we have the fact fairly proved, that without risking either sloughing of the wound, tetanus, or other ill consequence in a greater degree than when the knife is used, tumours, &c., of great vascularity may be removed without hemorrhage. That there are cases in which the effecting of this is of the greatest importance, no surgeon will doubt. In a certain number of selected instances, therefore, the écraseur may fairly be expected to enable us to remove tumours, &c., which otherwise it would be imprudent to meddle with. It may be interesting to observe that in Paris many surgeons have discarded the chain altogether, and employ only a cord. The latter is believed to cut with less contusion than the chain. It should be a soft cord of strong hemp, and not nearly so tightly twisted as whipcord. An instrument with a screw is also very preferable to one with a lever handle. Strong wire has been used with advantage in America.—*Med. Times and Gazette, July* 25, 1857, *p.* 89.

141.—*Various Formulæ for the Gelatinization of Cod-liver Oil.—M. Stanislas Martin's Jelly modified.*—Take of cod-liver oil, two ounces; fresh spermaceti, two and a half drachms; simple or other suitable syrup, and Jamaica rum, of each six drachms. Beat the ingredients together with the aid of heat, and when the mixture has acquired some consistence, pour it into a wide-mouthed bottle. *Cod-liver Oil solidified with gelatine.*—Take of pure gelatine, half an ounce; water, simple syrup, of each four ounces; cod-liver oil, eight ounces; aromatic essence, as much as may be sufficient. Dissolve the gelatine in the boiling water, and add successively the syrup, the oil, and the aromatic essence; place the vessel containing the entire in a bath of cold water; whip the jelly for five minutes at most, and then pour it, while still fluid, into a wide-mouthed glass

bottle, furnished with a cork, or with a pewter cap. or if a bottle be not at hand, into a porcelain or earthenware pot, which should be carefully closed. *Cod-liver Oil gelatinized with Carrageen or Irish Moss.*—Take of fucus crispus half an ounce; water, eighteen ounces; simple syrup, four ounces; cod-liver oil, eight ounces; any aromatic, according to taste. Boil the carrageen in the water for twenty minutes; pass the decoction through flannel; concentrate it until it is reduced to four ounces by weight; add the syrup, the oil, and the aromatic; whip the mixture briskly, having first placed it in a cold bath, and pour it, while still a little warm, into the vessel intended to receive it. The syrup may be replaced by an equal quantity of Garus' elixir, mint or vanilla cream or rum, &c.

M. Sauvan proposes to combine cod-liver oil with Iceland moss. *Lichen and Cod-liver Oil.*—Take of Iceland moss jelly, four ounces; gelatine, four scruples; hydrocyanated cod-liver oil, (to which two drops of essence of bitter almonds have been added), six drachms. Prepare the Iceland moss jelly in the usual manner; melt the gelatine and pass it into the vessel which is to hold it; then add the cod-liver oil: stir the entire with a spatula, until the mixture be homogeneous and the jelly begins to congeal. Dose—two or three spoonfuls daily.—*Bull. Gen. de Therap.—Dublin Hospital Gazette, Aug.* 15, 1857, *p.* 254.

142.—*Masking the Taste of Cod-Liver Oil.*—M. Leperdriel recommends the addition of 10 per cent. of common salt as the best means of masking the taste, not only of cod-liver oil, but various other kinds of fish oil. The salt may not only conceal the taste of, but add to the digestibility of the oil. Essence of aniseed further masks the oil, but for most persons the salt suffices.—*Med. Times and Gazette, June* 20, 1857, *p.* 624.

143.—ON THE ELECTRIC CAUTERY AND ITS APPLICATION TO DENTAL SURGERY.

By Thomas H. Harding, Esq.

[Mr. Marshall's paper in the 'Lancet' in May, 1851 (Retrospect, Vol. xxiii. p. 397) first suggested to the author, that the electric cautery might be employed for effectually destroying the sensitive pulp of a decayed tooth in a more certain, rapid, and safe manner than had previously been known.]

In the first volume of the 'Lancet' for 1851 there appeared a short communication from me on the destruction of the dental pulp by the heat of electricity, wherein I confidently stated that it might be regarded as a great advantage by all engaged in the practice of dental surgery. I had employed it for some months previous to the appearance of that paper, and fairly and justly claim to have been the

first to use it in dental surgery in this country. In the same number of that journal was described an instrument for applying electric heat in dental operations, by Mr. Waite; but I had used it before the time mentioned by Mr. Waite, and moreover was not acquainted with his invention.

Now, other methods have been employed for applying heat to destroy the nerve of an aching tooth. The old village doctress has long been famous for curing toothache by the thrust of a hot needle or pin into the tooth, and dentists have occasionally used a heated wire. The actual cautery has long been a practice in vogue for the purpose of destroying the sensibility of the tooth-pulp from caries, and has been generally performed by heating a long piece of steel, small at one end, but terminating in a bulbous head about the size of a small pea, which is inserted into a handle. From the bulbous extremity projects a piece of platina wire, smaller or larger according to circumstances; the bulbous end being heated in an ordinary lamp until a red or white heat is obtained, communicates the heat to the platinum wire, which is then immediately used for the purposes required. Another method of applying hot wires to the teeth is by means of platinum sponge and hydrogen gas, known as Œropile; but I have had no experience of the use of this.

In regard to the use of the actual cautery, let us see what Mr. Snell says of it in his book on the teeth: he says, "Even now, it (the destruction by the actual cautery) is frequently performed in an improper manner, which will account for the want of success which often attends it when attempted by ignorant men. As the operation is very generally performed, it would be more properly styled carbonizing the cavity of the tooth generally, than simply cauterizing the membrane." It must be obvious to every one that the great cause of failure, such as is here described, depends upon the difficulty experienced in obtaining a sufficient and permanent amount of heat; for it is well known that wire alone, which is the only substance sufficiently minute to be applied within the interior of a tooth, can retain the heat but for a very limited time. It is therefore necessary, in the hands of some dental surgeons, who are not satisfied with its effects, to apply it to the tooth certainly more than once, perhaps several times in succession. This must prove of very serious injury to the teeth, as it will carbonize a large surface of the tooth generally, instead of cauterizing or destroying the tooth-pulp solely. Now all this is completely removed by the use of the electric cautery, which can never be surpassed for convenience and ready mode of application, besides possessing a steady, uniform, and constant degree of heat, which can be continued at pleasure until the proper effects are obtained, and then as magically discontinued by destroying the connexion between the positive and negative wires. It has the advantage also, over every other known method of cauterizing, that it can be introduced into the patient's mouth, and actually placed within the

cavity of the tooth, before it is made to become incandescent,—an advantage that cannot be over-estimated by those conscientious dental surgeons who are so frequently called upon to destroy a tooth-pulp.

The *nature of the apparatus* which I am in the habit of using may be thus described. I shall speak of the battery first, and the cauterizer after :—

The *Battery* is a compound one of Smee's, and consists of six pairs of plates of zinc and platinized silver, contained in six cells, which are set in action by one fluid—viz., dilute sulphuric acid. The battery may of course vary according to the choice and taste of the operator, but it is desirable to render it as elegant and as simple in arrangement as possible. When I first employed the electric cautery, I used a battery of two pairs of plates in a single cell. I now prefer the larger battery of six cells, because a large battery with weak acid will last longer than a small one with strong acid ; besides this, the action of the battery is more uniform, and lasts much longer. A Smee's battery is the most convenient of application ; it is always clean, ready when wanted, and has the advantage moreover of cheapness. Grove's and Maynooth's batteries are not fitted for the purpose required, as they are troublesome, and often give out fumes of nitrous acid, which are decidedly objectionable.

The *Cauterizer* is thus constituted :—The terminal six inches of the poles, which are of copper wire plated, are supported on an ebony or ivory handle, upon the side of which one of the poles is interrupted at a particular point. The extremities of the poles are connected by a piece of platinum wire, a hundredth of an inch thick, and three-quarters of an inch long, which is bent into a loop. The sides of the loop are then brought parallel and nearly close to each other, without touching, and it is thus introduced into the pulp-cavity of the tooth to be operated on. By a slight pressure on one side of the handle, the interrupted pole is temporarily joined, and the platinum wire immediately becomes brilliantly heated, as it lies in contact with the tooth-pulp. Sometimes, however, I have found it desirable in the first place, to complete the galvanic current, and thus heat the platinum wire, before bringing it to bear upon the exposed pulp. The flexibility of the loop of wire enables the operator to bend it in any direction previously to use. In this way I have succeeded in rapidly destroying the pulps of decayed and condemned teeth, and have proceeded, sometimes after a few minutes, to the operation of filling with gold, or with other suitable stoppings, as Ash's metallic paste. I use several cauterizers with extremely thin wires, made expressly for myself by Maddox, of University-street.

Of the Operation in general.—The affected tooth being carefully examined, its cavity is to be well-dried out and cleaned ; a soft napkin is then introduced, to protect the mouth from the possibility of contact with the instrument, the platinum point of which is passed into the cavity of the tooth, is then heated, and, from its brilliancy, gives a

clear and distinct light, and the tooth-pulp is lightly touched with the heated wire, and the whole or particular portion of it required is destroyed. If the operator prefer it, he may have the wire heated before introduction into the mouth, but my own practice is generally to apply the wire before doing this, and then permitting of incandescence to take place in the mouth, which gives a light which is not seen by the patient, and so well illuminates the interior of the tooth, as to permit the tooth-pulp or diseased membrane to be seen very distinctly and clearly.

There is some caution to be observed in the use of this agent, which it will be as well to mention, and that is, to avoid burning or otherwise injuring the solid part of the tooth; particular attention and care should be paid to this point. This will not happen unless the application is prolonged, which will very rarely indeed be required, if special care be observed to have the wire at a white heat. This is the more necessary, to produce speedy destruction of the part to be touched, which is effected almost instantly. In one instance under my care, that of a lady for whom I nipped off the crown of an incisor tooth, for the purpose of fixing some artificial teeth, and so exposed the pulp of that tooth, I applied the electric cautery at barely a red heat, owing to feebleness of the acid; the consequence of this was, that the dental pulp became attached to the end of the wire, and was actually drawn out entirely. This has been preserved. It gave some slight pain for the moment, but nothing in comparison to the pointed steel or silver wire used by most dentists. This perhaps unimportant accident, I think, would not have occurred had the cautery been at a white heat, as it would then have completely carbonized or destroyed the part with which it came into contact.

The *effect* of the operation is the rapid destruction of the pulp of the decayed and condemned tooth; not the whole of the pulp for that is not always necessary, but that portion of it especially which is exposed. If this is done with a light, steady hand, no subsequent inflammation is produced upon the substance of the tooth, or in the cavity. If there should be any marked sensitiveness in the tooth, independent of the pulp, the slightest application of the cautery to it will prove effectual in completely removing it. In the large number of cases in which I have employed the electric cautery I have never known any bad effects produced on the tooth, and this I attribute to the care with which it has been applied. I am, however, quite prepared to believe that a want of attention in this respect would not only prove injurious to the tooth, but even in many instances cause its destruction. It would be only under such circumstances that the operation could be attended with or followed by severe pain.

In whatever condition the tooth-pulp may be, the operation is associated with a little pain. But as the time of its application is not unfrequently just a second or so, in the large majority of instances in which I have employed it, there has been no pain whatever felt. There

may be a sort of a twinge, which is but momentary; and whatever pain may arise is not to be compared to that arising from the process of extracting a tooth, which, as is well known, is by no means free from a very considerable amount of pain. Some of my patients have felt so little when it has been applied, that they have asked me to apply it a second time to make all certain that the dental pulp has been effectually destroyed.

The *subsequent filling of the tooth* is a matter which demands attention after the pulp is destroyed. If the cavity is examined very minutely, a small black speck or spot can be seen after the cautery has been used; this is due to the carbonization of the pulp, and is a guide to some extent in the after process of removal of the carious portion of the tooth, which should always be done after the sensibility has been destroyed by the electric cautery, and is to be accomplished with care in the usual manner, taking the precaution to leave none of the tooth in that condition remaining; every particle of it should be removed. For a few days afterwards, sometimes only one, but generally two, the cavity is allowed to remain filled with a combination of morphine and mastich, and then the tooth is stopped. Sometimes, again, I request my patients to allow a few days to elapse before I stop their teeth, the cavities being in the meantime filled with a solution of mastich and camphor. But I occasionally accomplish what I believe no other dentist has done, and that is, to plug, or stop the cavity in the same sitting during which the pulp has been destroyed. This, however, depends upon the complete absence of pain after the use of the cautery. I have already stated that there is always a little pain, but sometimes this at once disappears, and I then do not hesitate to stop the teeth permanently. I also do this if there has been a little bleeding from the cavity previous to cauterization, stopping the tooth immediately. It might be supposed this procedure of stopping the teeth immediately after the destruction of the pulp would be always followed by dull, aching pain; but I am happy to say that not the slightest indication of pain has, in the great majority of instances, ensued, in rather an extensive use of this powerful agent.

As a rule, however, the tooth should not be stopped on the same day as the electric cautery has been employed, unless in the exceptional instances just mentioned—the removal of the carious portion not being followed by sensibility. Experience and practice teach us to know the proper cases which can be plugged immediately.

By waiting a day or two, I have found by experience also, that any sensibility remaining after the destruction of the dental pulp, and removal of the carious parts of the affected tooth, is sure to disappear, assisted by the solution of morphine and mastich, or mastich and camphor, which occupies the cavity. By this time the cavity will bear the pressure of an instrument within it, and an examination will show that the destroyed pulp has receded considerably inwards; this is apparent by noticing the black discoloration from the previous carbonization of

the affected part, and as it is deeply situated, it is either out of the way of being pressed upon by the stopping of the tooth, or becomes a matter of the smallest possible importance, so far as my experience permits me to judge in this respect. I must, however, warn others not to mistake the black speck here referred to for actual caries.

Under the various circumstances which have been mentioned, the *results* of the operation are completely successful, and the teeth are serviceable for years. If, however, a tooth should remain tender after the use of the cautery, it is always better to wait for its complete disappearance before proceeding to stopping. I cannot call to mind any single instance in which the pain was at all persistent after its use, but it will be sure to become so, if the tooth is one not fairly suitable for preservation, from being either loose or diseased at the termination of a fang, such as a small fungous growth, or some similar cause. In such cases, the destruction of the tooth-pulp, accomplished no matter by what method, will prove unavailing and unsatisfactory, ultimate extraction in such instances proving the only resource. Should there be associated inflammation of the gums with a carious tooth, in which the pulp has been destroyed in the manner which has been recommended, then the usual means for combating it must be resorted to, such as a leech or two to the gum, and repeated fomentations with warm water alone, as I am in the habit of recommending, or with warm milk-and-water, or a poultice. For the pain in the tooth itself, morphine and mastich will be found quite sufficient.

Some patients express the receipt of immediate relief after the use of the cautery, others, again, not for an hour or two, but eventually they are quite relieved; the pain, however, is, I repeat, extremely slight.

In the large number of instances in which I have used the electric cautery to destroy the sensitive tooth-pulp, I have not known an *accident*, in the true sense of the word, to happen, unless I should except the case in which the dental pulp was suddenly drawn out attached to the platinum wire, which I have preserved for illustration, and depending upon, as has been said, the wire being at a red instead of a white heat. Such a circumstance might occur again in the hands of others. To avoid injury or accidents to the teeth or gums, it is necessary to keep the hand quiet, firm, and steady; the heated wires, if suddenly dislodged, would assuredly burn the cheek or gums, the tongue or palate, especially if steadiness was not particularly observed on the part of the patient. It was, I may say, only the other day, that an accident of this kind happened to a lady, in whose tooth I was applying the cautery; she suddenly turned her head, from some cause, when the heated wire touched the internal surface of the cheek. It may be observed, however, that so rapidly can the disconnexion of the wires be accomplished by removal of the finger from the handle of the instrument which is held in the hand, that an accident can really very seldom occur from the heated wire.—*Lancet, July* 18 *and* 25, 1857, *pp.* 54, 81.

144.—ON THE TREATMENT OF EXPOSED AND DISEASED DENTAL PULP.

No. II. of the 'Quarterly Journal of Dental Science,' which is worthy of the body of gentlemen whose organ it is, deserves our attention. There is a good paper by Mr. UNDERWOOD on the *Treatment of the exposed and diseased Dental Pulp*, which is more interesting to mechanical dentists than to medical men. The following passages, however, may be borne in mind:

"The parts of the teeth possessing nervous sensibility are the pulp, or as it is more generally termed, the nerve, the periosteum, and the fine membrane, situated between the enamel and the bone. Mr. Tomes considers the sensibility of this part of the tooth to be owing to the fibrils in the dentinal tubes; he says, the greater degree of sensitiveness observable in the dentine immediately below the enamel, that is at the point of ultimate distribution of the dentinal tubes, and consequently of the fibrils, may be fully accounted for, on the supposition that the latter are organs of sensation.

"No doubt the nervous filaments passing through the tubuli or else through the inter-cellular substance (for grave doubts have been thrown on the tubular structure of the tooth), form a plexus under the enamel which is highly sensitive; every practitioner knows that in excavating some teeth, there is no pain whatever felt on introducing the instrument, even into the pulp cavity itself; but a sharp pang is experienced immediately we touch the spot where the dentine and enamel come in contact; the sensibility however of this membrane need not interfere with plugging the tooth: no ill effects will follow it. That which is toothache, in the general acceptation of the word, proceeds from actual exposure of the dental pulp, and is characterised by acute and violent pain; a portion of food, or any foreign substance, entering the cavity, and coming in contact with the pulp, anything very hot or cold—in fact, exceeding in either of these respects the natural temperature of the mouth—immediately produces a paroxysm of pain along the whole course of the dental nerve extending up the head, fever, and general constitutional derangement.

"There are three modes of treatment open to us in these cases. Should the affected tooth be one of the incisors, or canines, the pulp may be removed either by a five-sided broach, or by pushing a straightened fish-hook up the cavity; give it a half turn, and withdraw it quickly, and in nine cases out of ten you will bring the nerve with it. The bleeding may be stopped by the application of camphorated spirit; after which remove all the carious bone, dry out the cavity, and plug at once. The second plan is to destroy the nerve entirely: the third, to render its exposed surface insensible. There are several escharotics useful for this purpose."

Mr. Underwood then describes the various escharotics. We omit his observations on the arsenical, and give the following:

"Tannic acid, or tannin, a vegetable acid, obtained chiefly from

nutgalls, has a strong affinity for albumen and gelatin, and its *modus operandi*, when applied to an exposed pulp, is, that it instantly unites with the albumen, and converts the surface of the pulp into a kind of leather covering, or cap, which protects the under surface from further injury or contact with any foreign substance. Upon this we may proceed to stop a tooth; the pulp in this case is not destroyed, but retains its vitality; the tooth is not a dead substance in the mouth, and consequently not so liable to periosteal inflammation; its normal functions are still carried on; when the nerve is not exposed, but where we find excessive sensibility of the dentine, tannin will be found a very valuable agent, as it at once coats the walls of the cavity with an insoluble compound, and destroys their sensitiveness. Some use it in a state of powder, but I prefer a solution in water or spirit—the spirit solution is perhaps the better.

"Chloride of zinc has been very largely used as an escharotic. It is soluble in chloroform, spirits of wine, ether, and water. In solution it is more prompt in its action, and also less painful; as with tannin it has a strong affinity for the albumen of the tooth, and when in contact with the dentine it is decomposed, and gives off chlorine, and thus acts as an antiseptic. In using this escharotic the tooth should be plugged two or three days after its application; if we wait longer we are likely to find the sensibility of the tooth again excited.

"Creasote forms a coating on the surface of the pulp, and restores its healthy action. It may be dissolved in alcohol or ether; but its effects are not so satisfactory as with some of the other agents mentioned; its antiseptic properties are very marked, and render it a useful aid to us where there is a secretion of pus. In such a case, by keeping the cavity dressed for a time with it, we may often plug a tooth which would otherwise have been lost.

"The nitrate of silver is also superficial in its action; the strength at which it should be used is a grain, or a grain and a half, to a drachm of distilled water; some dentists use the nitrate in its solid state, but I prefer the solution; it is more convenient for application. The cavity should be carefully dried out before introducing the dossil of wool, and the dressing should be renewed three or four times a-day. Your patient, if tolerably neat-handed, may do this himself; but you should impress on him the necessity of drying the cavity perfectly before introducing the nitrate. The formula given will be found very satisfactory; it is one of the safest remedies we can use for the purpose.

"Four or five grains of recently-burnt quick-lime, mixed with a grain of morphia, is a very certain escharotic. A little of the powder should be taken up on a piece of wool, and placed on the pulp, and the cavity closed with wax; this should be removed the next day; and if any tenderness remain, apply it again; if not, apply the alcoholic dressing for a few days, and then plug the tooth. The dressing which for the last few years I have most generally used, and on

which I place most reliance, is a strong saturated solution of camphor, the strength a drachm and a half of camphor to two drachms of spirit. The anodyne effect of the camphor is very marked, and though the remedy is longer in effecting its work than some of the others, it is decidedly safer. The patient should be ordered to change the wool three or four times a day. At first a complaint will probably be made against the taste of the camphor, but this will soon pass away. On an average, after two or three weeks, the tooth will bear excavating, and the exposed part of the pulp be insensible, and we can plug the tooth. By using this agent there will be no ill effects, the vitality of the tooth will still remain, its condition be healthy, and we shall have a permanently-useful, instead of a dead organ in the mouth.

"The actual cautery may often be used with great success in instantly producing an eschar, and in a few days the tooth may be plugged. The battery invented by Mr. Harding, Member of the College, and manufactured by Mr. Coxeter, for this purpose, is very convenient; you apply the wire to the pulp, unheated; by touching a spring contact is made, and it is instantly at a white heat: care should be taken not to wound the internal part of the pulp. You will find this in many cases preferable to some of the more powerful escharotics: for myself, however, I infinitely prefer the nitrate of silver diluted, or the solution of camphor. We more frequently meet with ossification of the pulp from the application of the actual cautery than from any other escharotic; this process of ossification goes on after the tooth is plugged, and where it is confined to the portion of the pulp in contact with the gold, helps to render the operation more successful. In conclusion, allow me to say that I have only drawn your attention to those local remedies which I have been in the habit of using, and of whose action I could speak with certainty; the constitutional treatment would have caused me to trespass too long on your time."—*Medical Circular, July* 22, 1857, *p.* 39.

145.—ON THE IMPORTANCE OF THE PULSE IN RELATION TO CHLOROFORM.

By Dr. Robert Dyce, Aberdeen.

I read constantly, that in giving chloroform you must put only a certain quantity upon the handkerchief, or whatever else is employed; that it is only safe to give it with this and that peculiar apparatus; that you are to watch the breathing, says one, the flickering of the eye and state of the tongue, says another; while a third raises the arm and lets it drop, as the only indication that a sufficient and safe amount of anæsthesia is produced. Now, I neither do the one nor the other of these things. I care not how much chloroform is poured upon the medium for its exhibition. I use no peculiar apparatus. I am indifferent as to the breathing, the eyes, the tongue, or any of

these things. To one thing only do I attend, and that is the pulse—the state of the circulation: but from the moment my patient begins to inhale, from that moment I keep my finger steadily upon the pulse, and by its rapidity, its regularity, and sometimes its volume, is the future quantity regulated. I know well that there are men of eminence in the profession who ridicule and sneer at such a procedure, but I defy them to point out a case of death where the pulse has been made the guide. Indeed, so satisfied am I from very extensive experience, that this is the only sure and unerring criterion of the extent of its influence upon the system, that I fearlessly give it to every class of patient, and at every period of life, from the earliest infancy to extreme old age. Your readers must, however, understand, that it is not by merely now and then, at uncertain intervals, taking hold of the arm and feeling the pulse, that reliance on it is to be placed—the finger must never be off it when inhalation is going on, and by this means, even blindfolded, the very earliest indication of danger is communicated.

There is a fatal case recorded as occurring in the Middlesex Hospital in July, 1854, where it is stated, "The pulse, which had risen to 120, descended to 70, having a full, steady, and deliberate beat;" again, "that at the end of ten minutes violent spasms were induced. These continued about three minutes, and then somewhat subsided." It then goes on to say that the pulse gave a few rapid and irregular beats, and then ceased, the face becoming pale and death-like; the inhaler was then removed instantaneously. On reading this case at the time of its publication, and on again perusing it, the same impression remains upon my mind, that to two circumstances may be attributed the unfortunate result:—1. As it is not specially stated to be otherwise, it is to be presumed that the inhalation was continued during the time of the "violent spasms," so as to get the patient as quickly over this state as possible—a plan which many recommend, and one, although I had misgivings, I once pursued myself. This I now consider extremely hazardous, because very seldom can the pulse be felt during this muscular rigidity, and because it is quite possible that the muscular walls of the heart may partake of the same state as the rest of the body. Be this as it may, if spasm or rigidity of the muscles prevents the pulse being distinctly felt, the inhalation must be instantly stopped until the spasms subside.

2. The pulse in this case is stated to have descended from "120 to 70." On reading this, one is led to conclude that a sudden dropping of the pulse to the lowest figure had taken place. Now this, in my experience, rarely happens; the time for the change is always appreciable and sufficiently well marked, if the pulse is steadily watched. There are, no doubt, differences in this respect in some cases, though rarely, as there are in the facility with which one patient inhales it over another; and this very circumstance is a strong argument in favour of a continuous watching of the pulse. I have known one

more full inhalation at this stage, when the pulse has begun to fall, sink it suddenly so low, that had another been allowed the heart would have ceased to beat. Generally, however, the pulse does not sink suddenly, but gradually—hence it always gives warning ; but no change, whether rapid or slow, must be disregarded. My plan is, therefore, never to persevere when rigidity comes on, and to stop, in like manner, when the pulse begins to fall, or else to give it very cautiously, and this cannot be done unless the finger is constantly on the pulse. So much for the velocity of the pulse—the chief point of attention. There are, however, two other qualities of the pulse which deserve attention—one is a state absolutely debarring its continuance ; the other state is comparatively of little value.

The first of these states, that of danger, is where the pulse becomes irregular or intermitting. This is not a common occurrence, nor does it seem to be dependent upon manifest disease of the heart, as far as I have observed ; yet I have always desisted, whenever this state of the pulse has come on, fearing some untoward result. One case I well recollect was upon the operating table, and was being put under chloroform : on three several times, just as unconsciousness was manifesting itself, the pulse became at once intermitting, and fell down perceptibly in quickness, without the slightest change in the breathing or rigidity of the muscles. In a few seconds the irregularity had ceased, and the inhalation, which had been stopped, was resumed. Again the pulse intermitted. A third time the same effect was produced on resuming the inhalation. In another case, that of a very stout female, a monthly nurse, who was about to have a fatty tumour removed from the shoulder, this irregularity in the pulse, twice in succession, showed itself on approaching unconsciousness, and latterly with excessive congestion of the face, but without spasm. I declined to continue it, and the patients were operated upon without it. This peculiarity in my experience is very rare ; for I cannot recollect, out of many hundred cases, above five or six where it came on. Three of the subjects were very fat persons. May not the same state of the heart have led to this peculiarity ?

The other state of the pulse is its volume. This I consider of little or no value as a guide, although, in every case, this is one of the first, if not the very first indication of commencing anæsthesia, the pulse becoming full and almost bounding. If the patient is in previous health it is also quickened ; as the effects become more manifest, the fulness subsides to its ordinary state, and remains, with very little alteration as to strength, throughout the period of unconsciousness. Continue the inhalation, and its velocity or rapidity is altered ; but, unless the pulse falls very much in quickness, its volume is seldom much affected. No reliance is, therefore, to be placed on this state ; it gives no warning of the nearness of danger, for I have seen it full, at least not weak, when its velocity was but 60. The only occasion where volume, or in other words, its strength or weakness is of moment

is, when a patient loses, or is likely to lose, much blood during a surgical operation; then double caution is necessary in administering chloroform. Hemorrhage weakens the strength, but increases the velocity of the pulse. Chloroform alone lessons the velocity; but, unless in excess, seldom alters the strength or volume of the pulse. Faintness, or complete syncope, may be only the effect of the hemorrhage; but, when faintness is present, even with imperfect unconsciousness from chloroform, it is always alarming, as the means at our command for rousing and stimulating the patient are limited to external means. Hence, I repeat, great watchfulness is requisite in continuing chloroform when hemorrhage is going on; and here the pulse is the sole and unerring guide.

With regard to the mode of administration I have nothing new to announce; there are, however, a few points to which I always attend, and which I may be excused mentioning, as I believe them to be of importance.

1. I use a clean, white, thin, or cambric pocket-handkerchief, folded from the corners inwards, as recommended by Professor Simpson, as being most easily managed.

2. I never measure the quantity poured upon the handkerchief, but thoroughly wet the centre (which is made slightly hollow), perhaps to a space the size of the palm of the hand. This must be renewed every few seconds, as it rapidly evaporates.

3. I never force the breathing of it pure at first, and always avoid coughing; hence the handkerchief is so held that a portion of atmospheric air is mixed with the chloroform; gradually it is brought nearer, so that at last the mouth and nose are covered, and it is then inhaled pure.

4. In all cases I produce complete unconsciousness at first, whether this state is to be kept up to the same extent or not; by this means a single inhalation afterwards, on any movement appearing, readily affects the patient. With half measures at first this is not so easily accomplished.

5. The person giving chloroform should have nothing else to attend to; his attention ought to be entirely confined to its administration and effects. I recollect some years ago assisting an eminent professor of surgery at an operation, where inattention to this rule proved nearly fatal to our patient. But if, as sometimes happens, when perfect and deep anæsthesia is induced, a few minutes pass without its being necessary to inhale, then this rule may be relaxed. I have in such circumstances frequently had to apply the midwifery forceps, and attend to the chloroform at the same time. The safe rule is, however, exclusive attention to the inhalation.

6. I find that much of the dread which patients experience on first taking chloroform preparatory to a surgical operation, is removed by making them inhale it the day previous. Any fear or reluctance they may have had is thus invariably removed, and when upon the operat-

ing table they take it much more readily, and hence are much sooner affected.

7. If possible, the stomach should be empty, or the food should have been taken some hours before inhaling it; by this means sickness and vomiting are avoided. The nausea previous to vomiting often depresses the strength of the pulse, and may cause alarm; but as there is seldom perfect unconsciousness, the pulse remains quick, and on the occurrence of vomiting the weakness of the pulse disappears.

In conclusion, I always take care to have a small phial with strong liquor ammonia at hand; the only restorative I have ever had occasion to use.—*Med. Times and Gazette, May* 23, 1857, *p.* 509.

146.—*Ether and Chloroform Gelatinized.*—Professor Rusponi has succeeded in turning ether and chloroform into gelatine, by shaking them with white of egg in a closed receiver. The compound obtained with the ether is semi-transparent; with the chloroform it is white and opaque. This gelatine is soluble in water, and may be spread on linen in the form of a poultice. It will likewise mix with morphine, cantharidine, conicine, &c., and may thus become of great therapeutical use.—*Lancet, Aug.* 8, 1857, *p.* 144.

147.—*On Chlorodyne.* By Dr. Thomas A. Henderson, Physician to the Ramsgate Infirmary.—[Dr. Henderson has been much pleased with the effects of chlorodyne in a case of severe pain in the hip-joint and in the vertebræ of the neck, in a patient long subject to chronic rheumatism.]

He could not tolerate opium, hyoscyamus, or belladonna, and, in despair almost, I gave him a prescription for a mixture of chlorodyne, in water, the dose being twelve minims. He only took two doses which acted so well that he compared his feelings to being transported to Paradise. The effects lasted for several days. Whenever his pains return he now takes a dose at bed-time, feeling secure of an escape for some days from suffering. I have also applied it locally, with good results, but in too few cases to report much on it. It produces a certain amount of warmth and perspiration, with a remarkably soothing state of mind, as well as arresting the pain. No headache or other unpleasant symptoms followed its administration.—*Medical Times and Gazette, Oct.* 10, 1857, *p.* 382.

148.—*Enema of Borax.*—Arguing from the good effects of the local use of borax in aphthæ of the mouth, M. Bouchut proposes its employment, in the form of enema, in those cases of intestinal catarrh in children in which the mucous membrane becomes ulcerated around the anus. The formula he suggests consists of a drachm of borax to five ounces of a light decoction of pearl barley; this quantity of borax to be progressively increased to a drachm and a-half, or a little more.—*Dublin Hospital Gazette, Aug.* 15, 1857, *p.* 253.

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